# mCom User Manual

Machinery Compliance Software – Version 1.0.4.1

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## Installing the software from CD

During installation, it may be necessary to restart your PC. This happens when files that need to be updated are currently in use. On some Windows systems these files are also classed as protected files and cannot be updated without rebooting.

Insert the mCom CD into your CD/DVD drive.
If the installer does not Auto run then go to My Computer.
Locate your CD/DVD and double click to run the CD.
The mCom install window should appear.

Install the software by following the on-screen instructions. To update your system the PC may need to restart. After the restart you may need to run the setup a second time to continue the installation process but this should happen automatically if required..

## Installing the software from a download

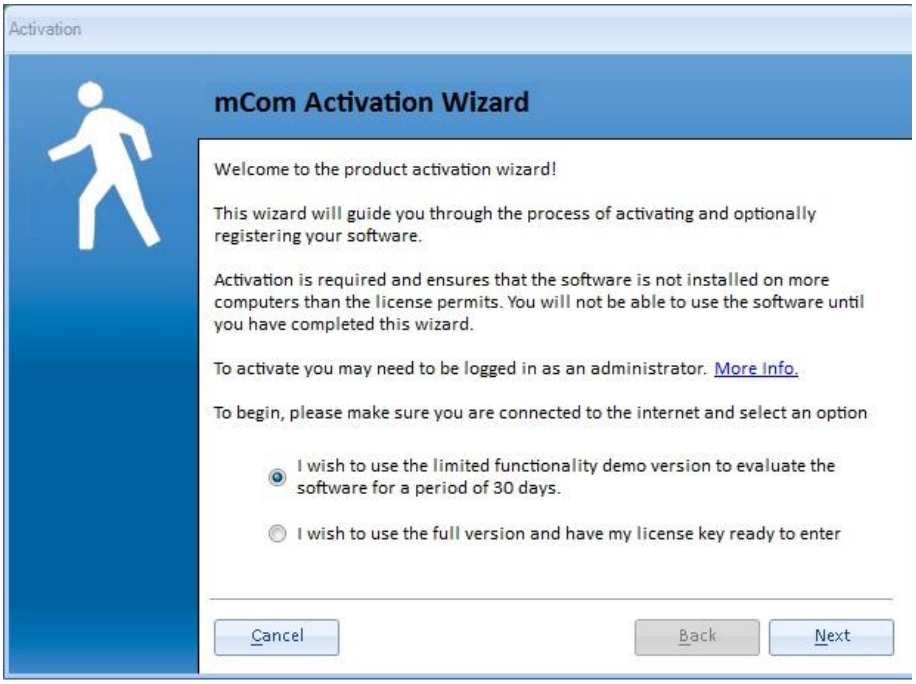
You can download mCom from the website http:\\www.laidlersoftware.com From the website download the demo. If you have a licence key for mCom entering this during installation will convert the demo version to the full version.

Locate your downloaded installation file and double click it to open the installation screen. Install the software by following the on-screen instructions. To update your system the PC may need to restart. After the restart you may need to run the setup a second time to continue the installation process but this should happen automatically if required.

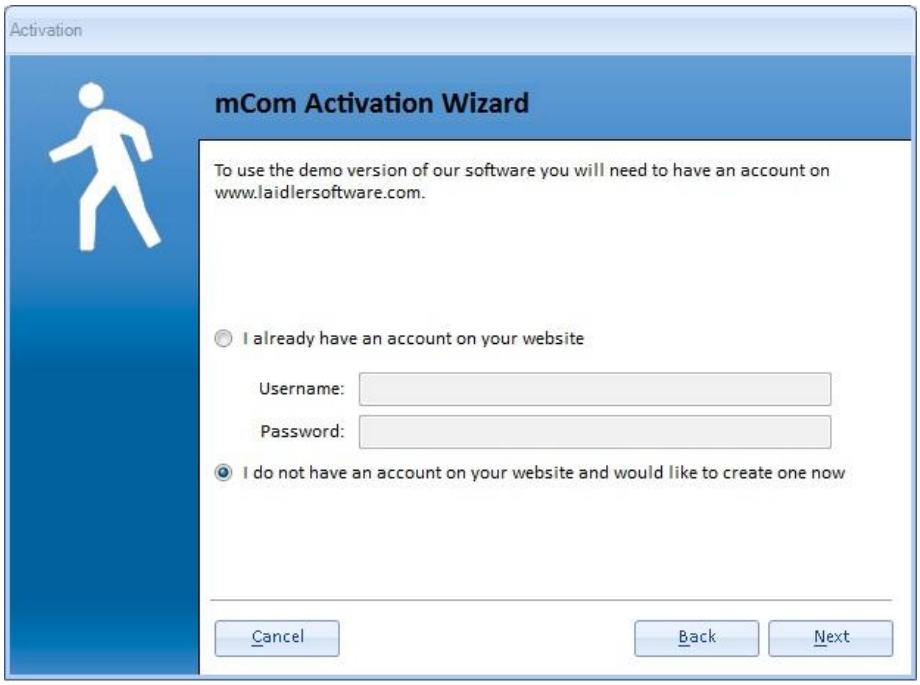
# Running mCom for the First Time

## Evaluation Mode

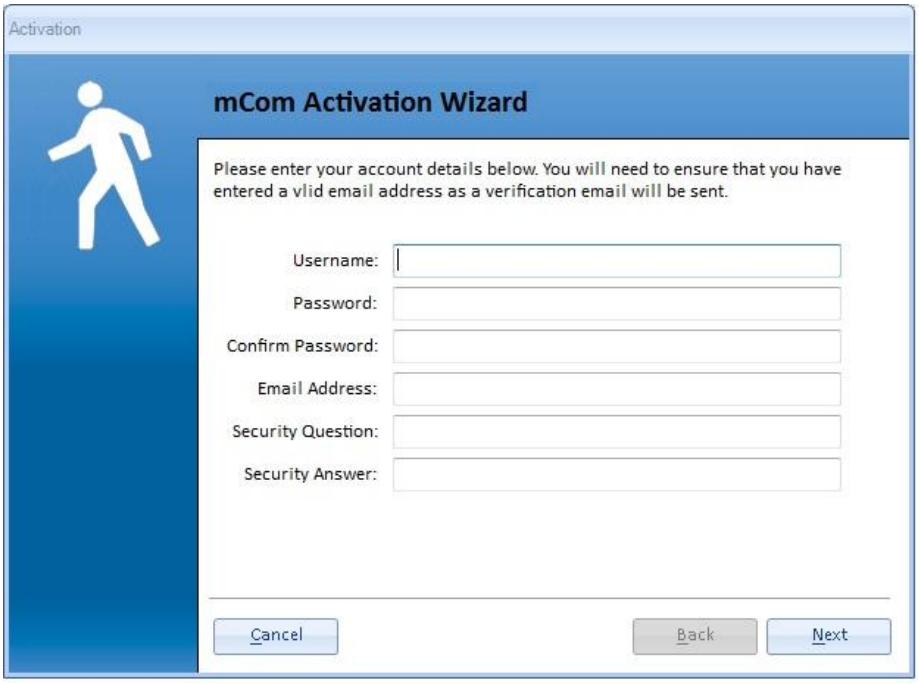
When you run the software for the first time you will have to either activate the software using the license key supplied or register the software for evaluation.


Activation
mCom Activation Wizard
Welcome to the product activation wizard!
This wizard will guide you through the process of activating and optionally registering your software.
Activation is required and ensures that the software is not installed on more computers than the license permits. You will not be able to use the software until you have completed this wizard.
To activate you may need to be logged in as an administrator. More Info.
To begin, please make sure you are connected to the internet and select an option
I wish to use the limited functionality demo version to evaluate the software for a period of 30 days.
I wish to use the full version and have my license key ready to enter
Cancel
Back
Next

To register for the evaluation click next. The screen below will be displayed. If you have registered on the website you can enter you user name and password to proceed other wise select to create an account.


Activation
mCom Activation Wizard
To use the demo version of our software you will need to have an account on www.laidlersoftware.com.
I already have an account on your website
Username:
Password:
I do not have an account on your website and would like to create one now
Cancel
Back
Next

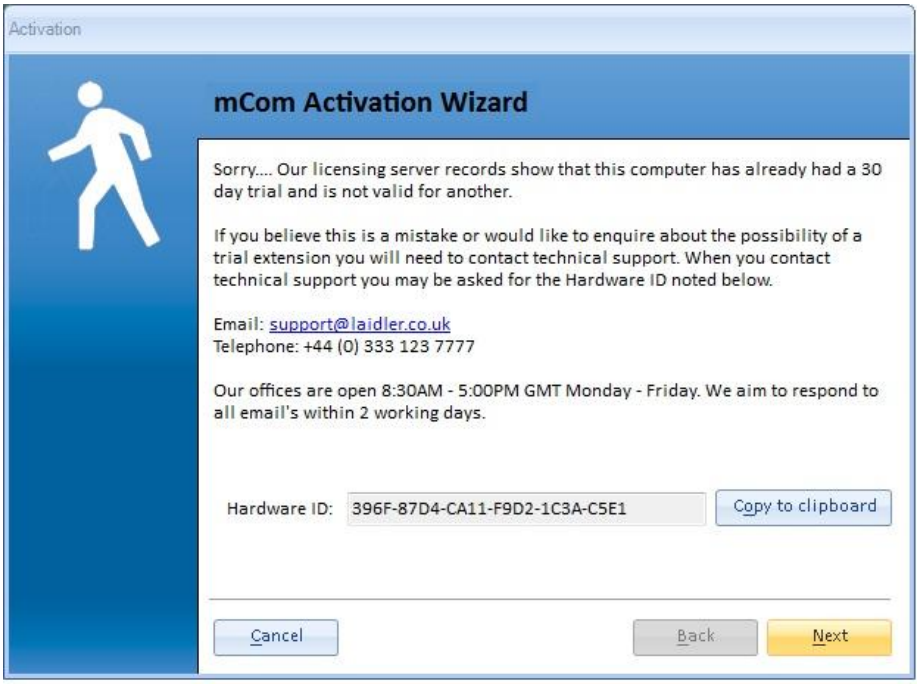
Enter your details, ensure you have input the correct email address as this will be used to activate the account and also to email the license file.




After clicking [Next] the software will communicate with our server to record your details and generate a license file.

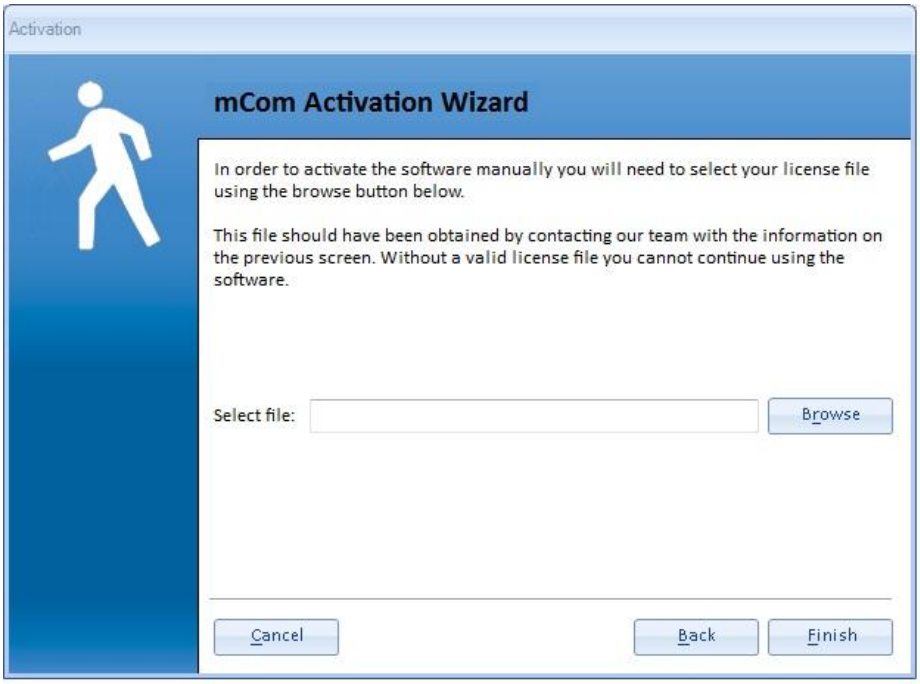
Check your email to activate the account and collect the license file.

If you have installed the software previously the screen below will be displayed. We are able to extend the evaluation period if required.


Activation
mCom Activation Wizard
Sorry.... Our licensing server records show that this computer has already had a 30 day trial and is not valid for another.
If you believe this is a mistake or would like to enquire about the possibility of a trial extension you will need to contact technical support. When you contact technical support you may be asked for the Hardware ID noted below.
Email: support@laidler.co.uk
Telephone: +44 (0) 333 123 7777
Our offices are open 8:30AM - 5:00PM GMT Monday - Friday. We aim to respond to all email's within 2 working days.
Hardware ID: 396F-87D4-CA11-F9D2-1C3A-C5E1
Copy to clipboard
Cancel
Back
Next

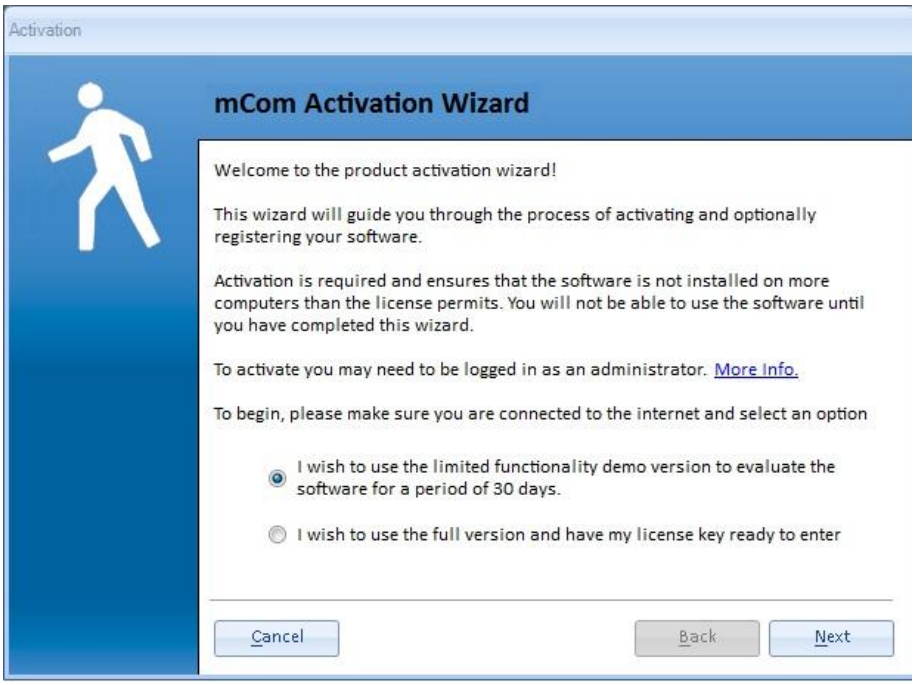
Once you have the license file, copy it from your email to your PC.  In the mCom activation wizard browse to the file location and open the license file.  The software will now run in evaluation mode for 30 days.

Evaluation mode restricts the questions in the software to three per section and also disables the checklist reports.

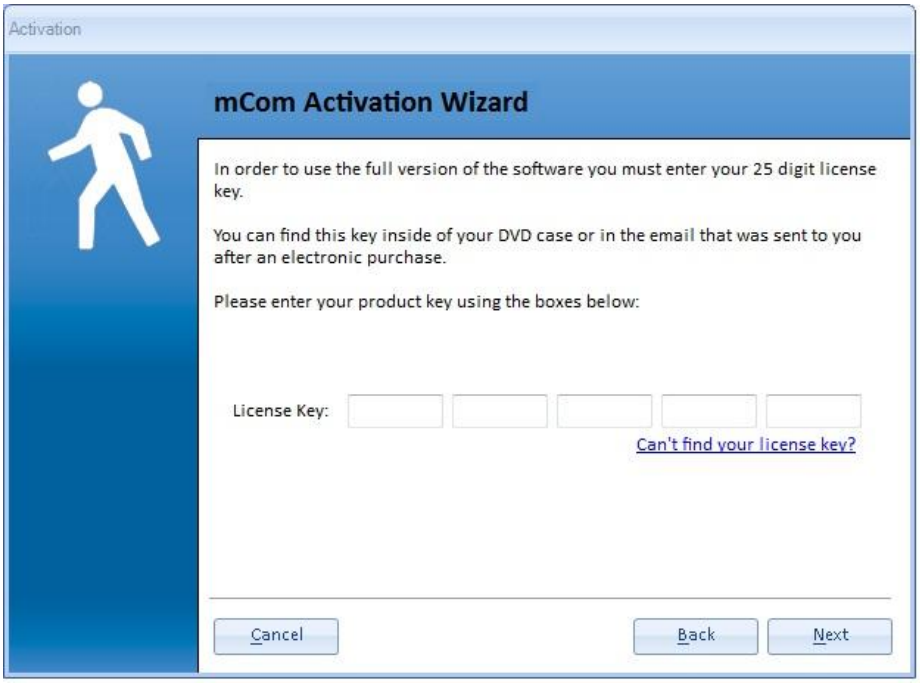

Activation
mCom Activation Wizard
In order to activate the software manually you will need to select your license file using the browse button below.
This file should have been obtained by contacting our team with the information on the previous screen. Without a valid license file you cannot continue using the software.
Select file:
Browse
Cancel
Back
Finish

## Activating mCom Full Version

To begin the activation process for the full version select 'I wish to use the full version and have my license key ready to enter', then click [Next].

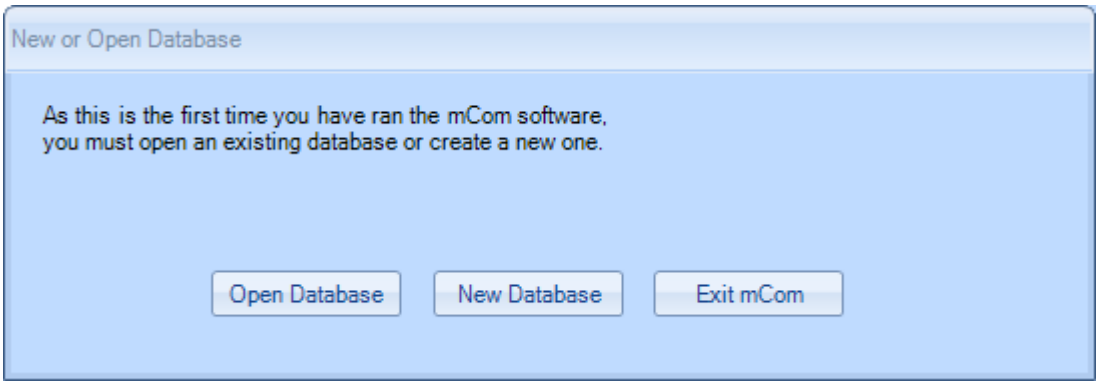

Activation
mCom Activation Wizard
Welcome to the product activation wizard!
This wizard will guide you through the process of activating and optionally registering your software.
Activation is required and ensures that the software is not installed on more computers than the license permits. You will not be able to use the software until you have completed this wizard.
To activate you may need to be logged in as an administrator. More Info.
To begin, please make sure you are connected to the internet and select an option
I wish to use the limited functionality demo version to evaluate the software for a period of 30 days.
I wish to use the full version and have my license key ready to enter
Cancel
Back
Next

Enter your activation code click [Next] and follow the onscreen prompts.


Activation
mCom Activation Wizard
In order to use the full version of the software you must enter your 25 digit license key.
You can find this key inside of your DVD case or in the email that was sent to you after an electronic purchase.
Please enter your product key using the boxes below:
License Key:
Can't find your license key?
Cancel
Back
Next

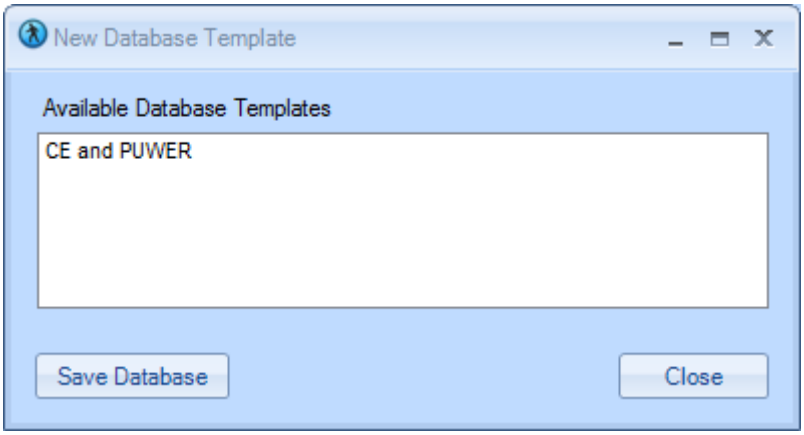
# Your First Database

After the licensing screens have been completed, you will enter mCom. The first time you enter mCom you will be presented with the screen below. If you already have an mCom database, click [Open Database] and browse to the file location.


New or Open Database
As this is the first time you have ran the mCom software,
you must open an existing database or create a new one.
Open Database
New Database
Exit mCom

## Creating a New Database

If you have no previous databases then you must create a new one. Click [New Database]. You need to select a database template. By default mCom comes with 'CE Marking and PUWER'. Select this template and click [Save Database].



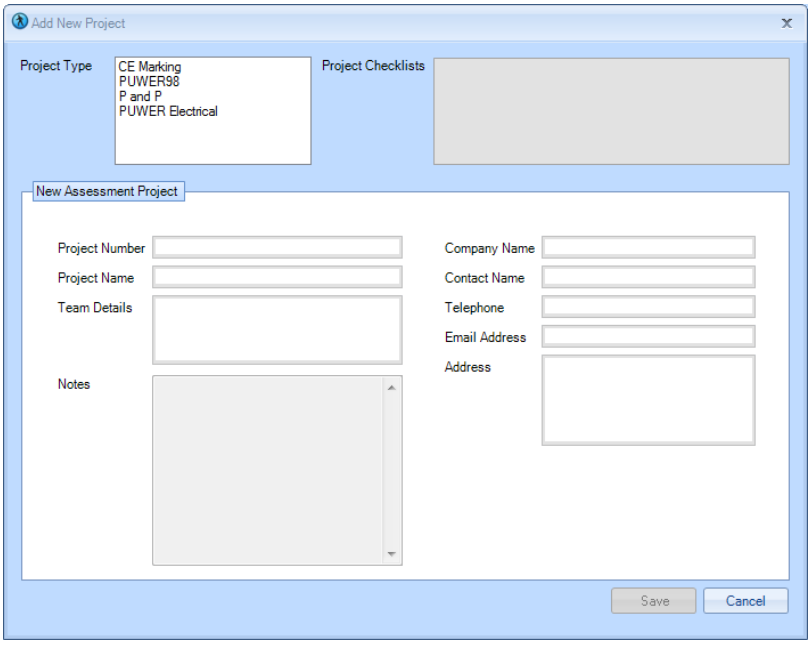

Locate a suitable place to store your database, either on your local PC or on a server. If several users need to access the database you should store it on a shared drive/folder.

The mCom database has the file extension of '.rdb2'.

## Adding a New Project

A project in the software sets the questions for the assessment. Selecting a CE Marking project will load questions for CE Marking, a PUWER project will load the PUWER'98 questions and so on. A project can only contain one type of questions, so you can't mix PUWER and CE Marking within one project. You can however have two projects (one CE Marking and one PUWER) within the same database. In fact you can have as many projects as you require in one database.

In the [Project Functions] menu section, select [New Project].

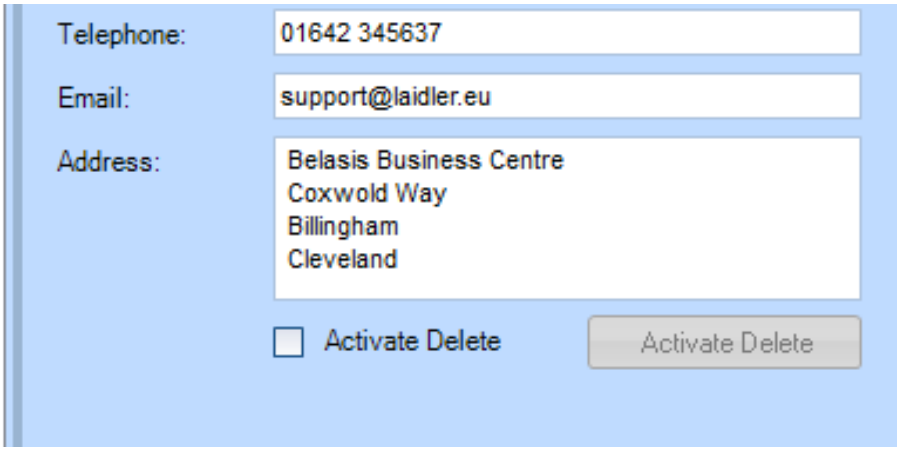



In the screen that's displayed, select the project type you require.

- CE Marking -Full CE Marking checklist
- PUWER98 -Full PUWER'98 checklist
- P and P -PUWER'98 Policies and Procedures section
- PUWER Electrical -PUWER'98 Electrical question only – Used for electrical panels etc.

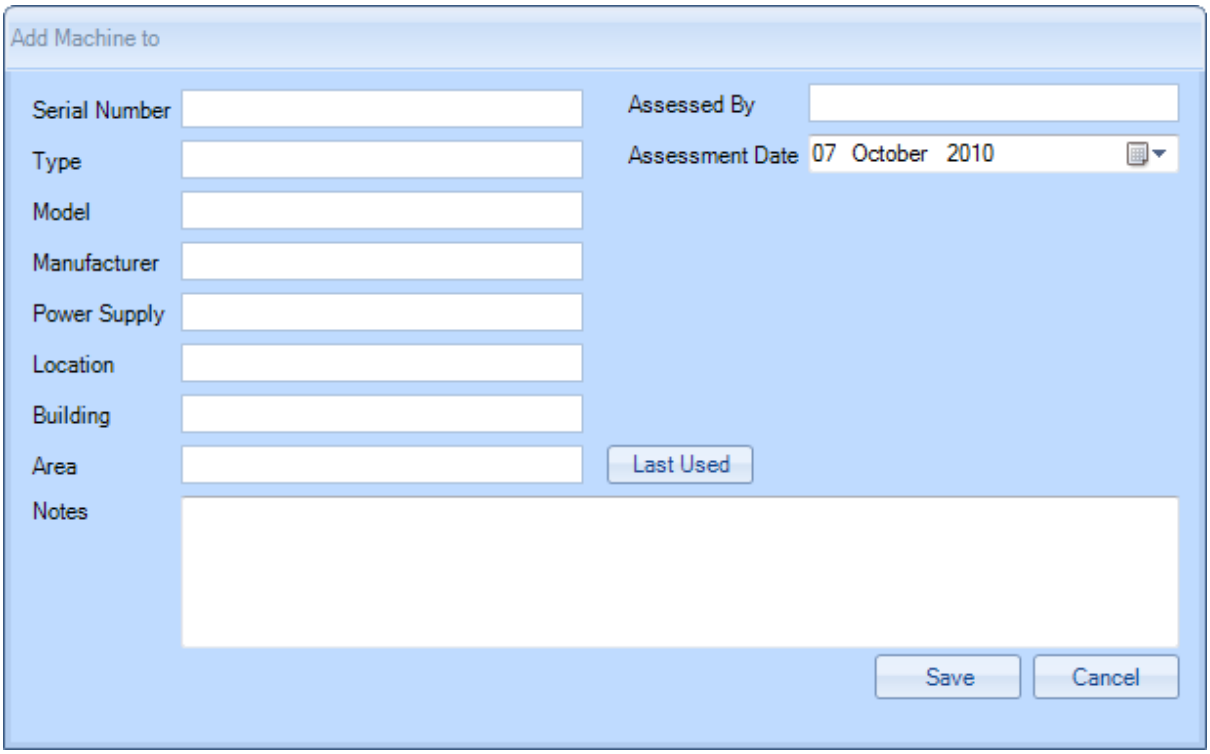
After making the selection, complete the text boxes with the relevant information. Some of the information input here may be used in other parts of the software, such as company name and address. It can be changed at anytime from the projects screen.

To delete a project, firstly select the project in the tree view, check the [Activate Delete] check box. This will enable the [Activate Delete] button, after clicking this the button text will Change to [Delete Project]. You will then see a couple of prompts before the delete takes place. ALL project data will be deleted with NO backup, hence the several clicks to perform this action.



## Adding a Machine to a Project

With a project selected in the tree view, click the [Add Machine] button in the Project Functions menu. The screen below will be displayed with a number of text boxes to be completed with the machine details.




Complete the details as required and click [Save]. The machine will now appear on the tree view list, within the Project section.

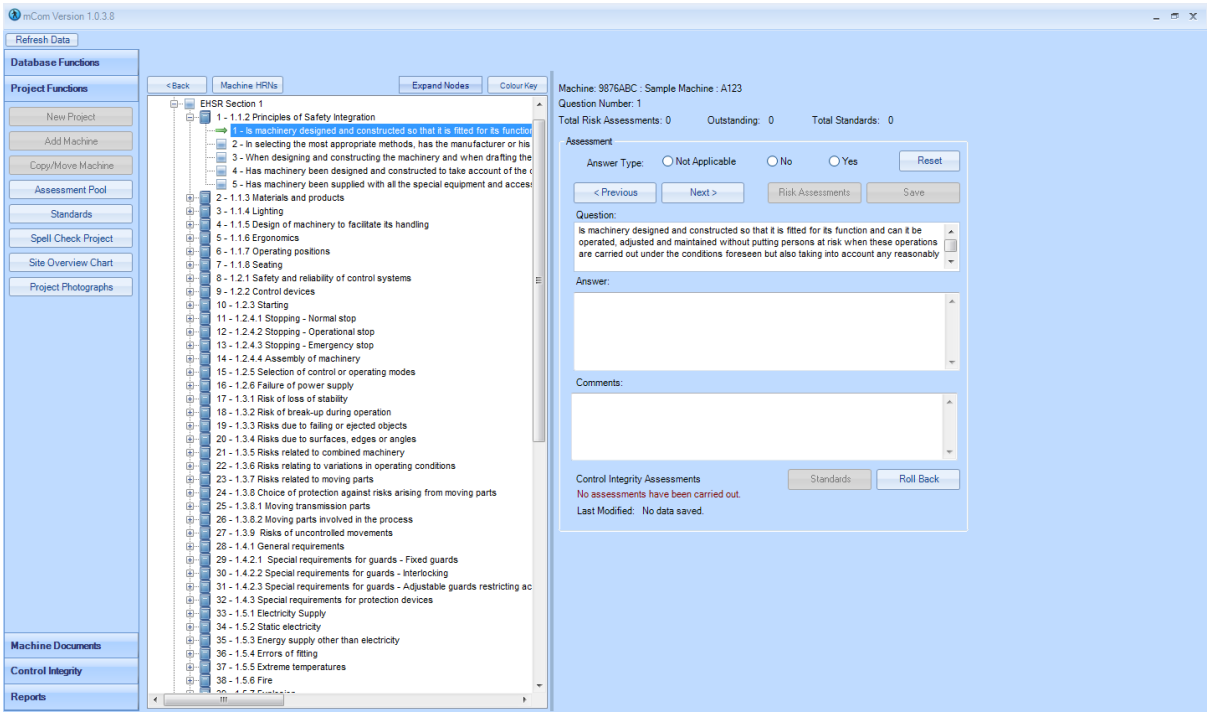
The [Last Used] button on this screen will automatically complete the Location, Building and Area fields using the values you entered from the last machine. These values are only stored while the application is running; once the application is closed the values are disregarded.

To delete a machine, firstly select the machine in the tree view and check the [Activate Delete] check box. Click the [Activate Delete] button. You will see the button text change to [Delete Machine]. You will then see a couple of prompts before the delete takes place. ALL machine data will be deleted including risk assessments and any attached photographs etc.

# Displaying the Checklist Questions

To display the Questions/Answers screen, double click on a machine in the tree view. The screen will change to display the questions related to the project you created in an earlier stage.

Clicking the + icon or double clicking the text on the tree view will expand the sections to list sub sections and then the questions for your chosen project.


Refresh Data
Database Functions
Project Functions
New Project
Add Machine
Copy/Move Machine
Assessment Pool
Standards
Spell Check Project
Site Overview Chart
Project Photographs
Machine Documents
Control Integrity
Reports
< Back
Machine HRNs
Expand Nodes
Colour Key
EHSR Section 1
1 - 1.1.2 Principles of Safety Integration
1 - Is machinery designed and constructed so that it is fitted for its functio
2 - In selecting the most appropriate methods, has the manufacturer or his
3 - When designing and constructing the machinery and when drafting the
4 - Has machinery been designed and constructed to take account of the
5 - Has machinery been supplied with all the special equipment and acces
2 - 1.1.3 Materials and products
3 - 1.1.4 Lighting
4 - 1.1.5 Design of machinery to facilitate its handling
5 - 1.1.6 Ergonomics
6 - 1.1.7 Operating positions
7 - 1.1.8 Seating
8 - 1.2.1 Safety and reliability of control systems
9 - 1.2.2 Control devices
10 - 1.2.3 Starting
11 - 1.2.4.1 Stopping - Normal stop
12 - 1.2.4.2 Stopping - Operational stop
13 - 1.2.4.3 Stopping - Emergency stop
14 - 1.2.4.4 Assembly of machinery
15 - 1.2.5 Selection of control or operating modes
16 - 1.2.6 Failure of power supply
17 - 1.3.1 Risk of loss of stability
18 - 1.3.2 Risk of break-up during operation
19 - 1.3.3 Risks due to falling or ejected objects
20 - 1.3.4 Risks due to surfaces, edges or angles
21 - 1.3.5 Risks related to combined machinery
22 - 1.3.6 Risks relating to variations in operating conditions
23 - 1.3.7 Risks related to moving parts
24 - 1.3.8 Choice of protection against risks arising from moving parts
25 - 1.3.8.1 Moving transmission parts
26 - 1.3.8.2 Moving parts involved in the process
27 - 1.3.9 Risks of uncontrolled movements
28 - 1.4.1 General requirements
29 - 1.4.2.1 Special requirements for guards - Fixed guards
30 - 1.4.2.2 Special requirements for guards - Interlocking
31 - 1.4.2.3 Special requirements for guards - Adjustable guards restricting ac
32 - 1.4.3 Special requirements for protection devices
33 - 1.5.1 Electricity Supply
34 - 1.5.2 Static electricity
35 - 1.5.3 Energy supply other than electricity
36 - 1.5.4 Errors of fitting
37 - 1.5.5 Extreme temperatures
38 - 1.5.6 Fire
Machine: 9876ABC : Sample Machine : A123
Question Number: 1
Total Risk Assessments: 0
Outstanding: 0
Total Standards: 0
Assessment
Answer Type:
Not Applicable
No
Yes
Reset
< Previous
Next >
Risk Assessments
Save
Question:
Is machinery designed and constructed so that it is fitted for its function and can it be operated, adjusted and maintained without putting persons at risk when these operations are carried out under the conditions foreseen but also taking into account any reasonably
Answer:
Comments:
Control Integrity Assessments
Standards
Roll Back
No assessments have been carried out.
Last Modified: No data saved.

# Answer a Question

Select a question from the tree view. Select the answer you require from the radio buttons on the right side of the screen, Yes, No and Not Applicable. The software is designed around positive answers. In most cases the positive answer is Yes, but some questions have a positive answer of No. A positive answer is displayed with a green tick next to the radio button and the answer text is inserted into the answer text box. The question icon is changed to green in the tree view displaying a positive answer for that question. Once you are happy with the answer click [Save].

The default answer text can be modified if required.

Clicking the [Reset] button will reset the question to an unanswered state.

The [Roll Back] button is used when editing an answer. If you have made changes to an already saved answer and wish to disregard the changes, the [Roll Back] button will return the answer to the state it was last saved as.

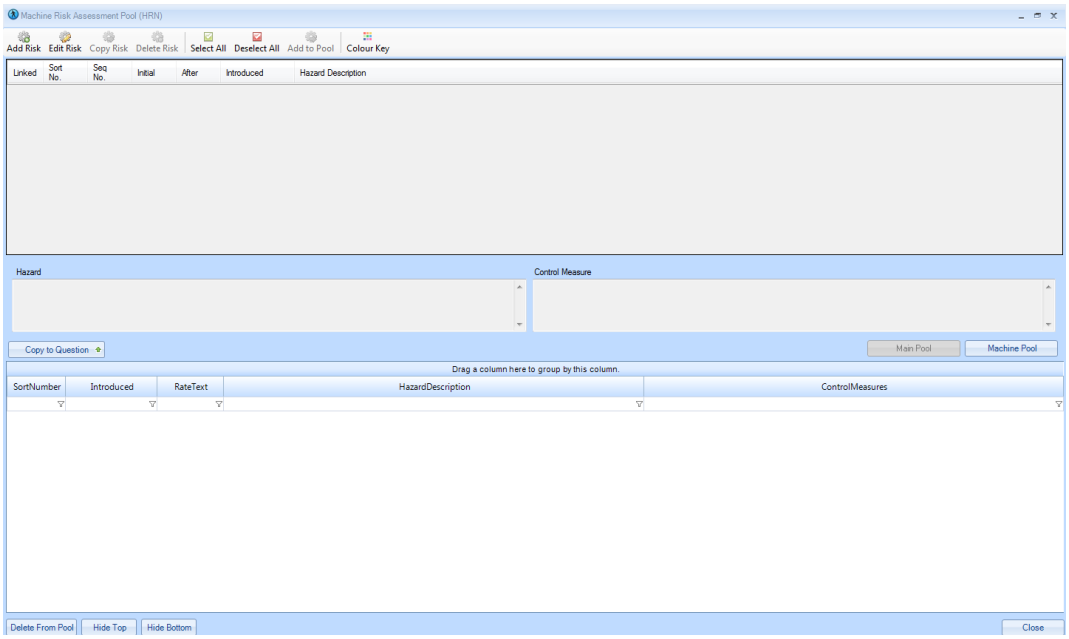
You can also add comments to an answer to maybe explain the answer in more detail or give further information. Giving a negative answer to a question will prompt you to enter a risk assessment. In most cases 'No' is the negative answer. When clicking the [No] radio button the text (See Risk Assessments) appears in the Answer text box. When you click [Save] the [Risk Assessments] button becomes available (see adding risk assessments).

The [< Previous] and [Next >] buttons will display the associated question in the section.

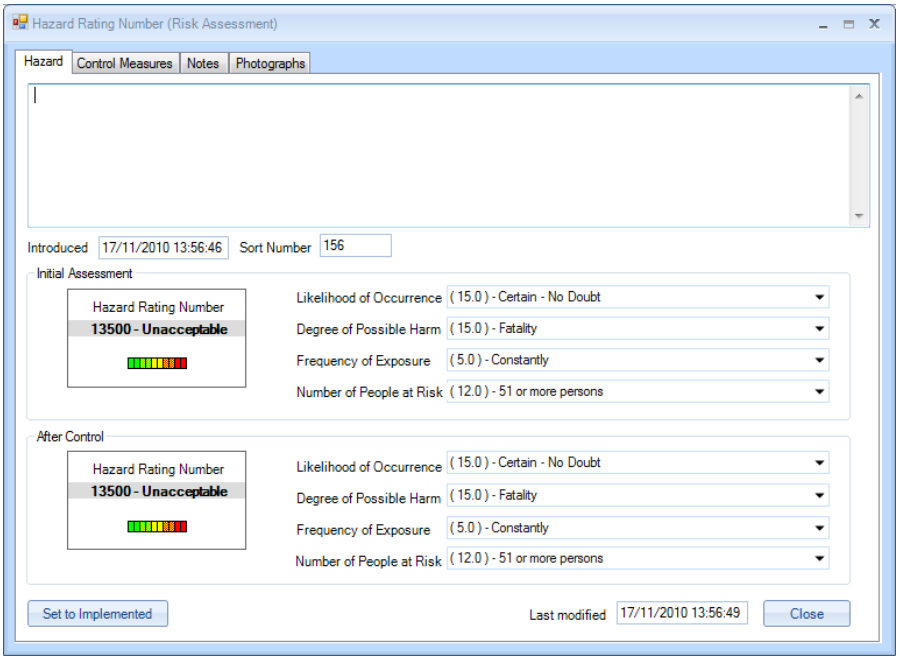
# Adding a Risk Assessment

After answering a question with a negative answer the [Risk Assessments] button becomes available. Click the [Risk Assessments] button to view the risk assessments associated with the machine/question.

When using the software for the first time no risk assessments will be available. The Machine Risk Assessment Pool screen will show empty grid views.




Lets get started and add a new risk assessment. Click [Add Risk]. The Hazard Rating Number (HRN) screen will be displayed displaying four tabs, Hazard, Control Measure, Notes and Photographs. Start by entering the hazard description in to the Hazard text box.



Using your skill and judgement, select the initial assessment from the drop down boxes:

- Likelihood of Occurrence (LoO)
- Degree of Possible Harm (DoPH)
- Frequency of Exposure (FoE)
- Number of People at Risk (NoPaR)

You may also enter the After Control assessment if you are confident of the values required. The sort number field on this screen is used to reference the hazard and can be changed to any integer number if required. It's used as a reference only and not displayed on any reports.

The introduced date field displays the date and time that the risk assessment was created and the Last Modified fields shows the last time any changes were made to the risk assessment.

To enter a Control Measure description click on the [Control Measures] tab at the top of the screen and enter the control measures description to eradicate the risk. If you have not already, you should enter the control measures hazard rating values at this point. The After Control values should be chosen as if the control measures have been carried out.

The Carried out by field on this tab is to display the name of the person assigned to carry the actual work out on the machinery. It will default to the company name until it is changed by the user.

The Recommended Completion Date is the expected date for the work to be carried out.

The implemented date is the actual date that the work was carried out. Once it is confirmed that the control measures work is complete and correct, the risk assessment can be implemented by selecting the implemented date and clicking the [Set to Implemented] button. If no date has been set for the implemented date, the current date and time will be used. **Once a risk assessment has been implemented, it cannot be changed or deleted.**

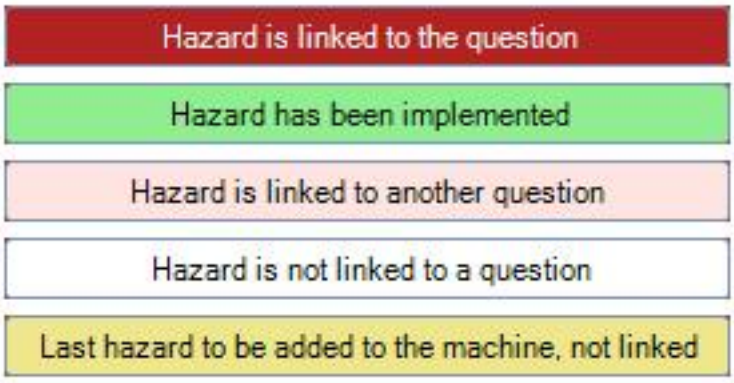
Clicking the [Notes] tab will display the notes screen for the current risk assessment.

Clicking the [Photographs] tab will display the photographs screen for the current risk assessment, we will cover this screen later in the manual.

Once you've completed the various screens that make up the risk assessment click the [Close] button. The risk assessment saves the data as you enter it, hence there's no save button. After clicking close you are returned to the HRN Pool, you will now see your risk assessment in the top grid view.

The top grid view shows risk assessments that are linked to the machine you are assessing. To link the risk assessment to the question you have just answered you must click the check box in the 'Linked' column in the top grid view. The risk assessment will now appear in the To Do report and the Checklist report for the current machine/project.

The [Colour Key] button will open a screen to show the meaning of the row colours of the risk assessments.


Hazard is linked to the question
Hazard has been implemented
Hazard is linked to another question
Hazard is not linked to a question
Last hazard to be added to the machine, not linked

## Edit a Risk Assessment

To edit an existing risk assessment either double click it in the grid view or select it from the grid view and click the [Edit Risk] button. Make the changes you require and click [Close]. All edits are saved on closing the screen.

## Delete a Risk Assessment

Select the risk assessment from the machine grid view. Ensure you have selected the correct risk assessment before clicking the [Delete Risk] button. You will be prompted to delete the risk before the risk is removed.

If as risk assessment is linked to a question it must be unlinked (untick the 'Linked' tick box) before it can be deleted.

Risk assessments that are coloured light pink denote that they are attached to another question. When you select a pink risk assessment and click delete you will be shown the questions that this risk assessment is linked to. At which point you can choose to go ahead with the delete or cancel.

## Copy a Risk Assessment

Risk assessments are copied in the Machine Risk Assessment Pool screen. Clicking the [Machine Pool] button will show the risk assessment attached to the machine, weather they're linked to a question or not. They are displayed in the bottom grid view. To copy an assessment, select it in the bottom grid view and then click [Copy to Machine]. This operation has now created a new risk assessment, which can be edited as normal. Also, note the colour of the copy, being Khaki. This colour shows that this is the latest risk assessment to be added to the machine and is used simply as a reference. The colour will be replaced if overridden by another process i.e. linked to a question or implemented.

To copy assessments from the pools grid (bottom grid) you have several options. Select the assessment row with a single left mouse click and then click [Copy to Machine]. You can also select multiple rows by holding down the Ctrl key and selecting the rows with a single left mouse click.

Once multiple rows are selected click [Copy to Machine]. You can also copy assessments by double clicking the row with the left mouse button and finally by hitting the [Enter] key on the keyboard will copy the currently selected row.

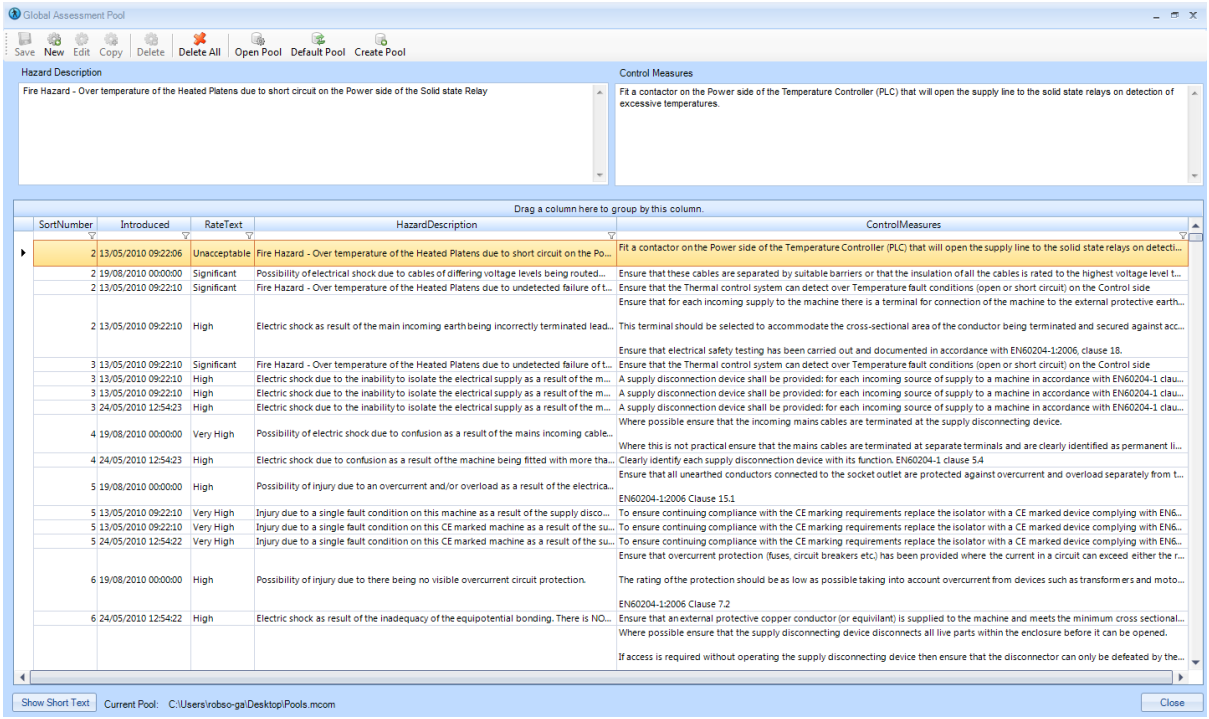
To delete an assessment from the pool, click the [Delete from pool] button. To delete an assessment from the machine pool/question click the [Delete] button at the top of the screen.

You can hide the top or bottom grids to show more of the pools by click the associated buttons at the bottom left of the window. Even with the grids hidden the functions will still work.

It is also possible to group assessments in the pool to allow you to locate an assessment more quickly when you have many in a pool. Drag a column header in to the groups bar, dragging the 'RateText' column will group the risks by their severity, but the same can be done with any of the coluns.

## The Main Risk Assessment Pool

As well as the machine risk assessment pool, the software can store common risk assessments in the Main Assessment Pool allowing the ability to copy from the main pool to a machine.


Global Assessment Pool
Save
New
Edit
Copy
Delete
Delete All
Open Pool
Default Pool
Create Pool
Hazard Description
Fire Hazard - Over temperature of the Heated Platens due to short circuit on the Power side of the Solid state Relay
Control Measures
Fit a contactor on the Power side of the Temperature Controller (PLC) that will open the supply line to the solid state relays on detection of excessive temperatures.
Drag a column here to group by this column.
SortNumber
Introduced
RateText
HazardDescription
ControlMeasures
Show Short Text
Current Pool: C:\Users\robso-ga\Desktop\Pools.mcom
Close

There are two methods to add risk assessments to the Main Pool.

1. From the Machine Risk Assessment Pool screen, select a risk assessment from the top grid view. Clicking [Add to Pool] will make a copy of the selected risk assessment in the Main pool.
2. If you are in the Risk Assessment Pool screen, close the screen and select [Assessment Pool] from the Project Functions menu.

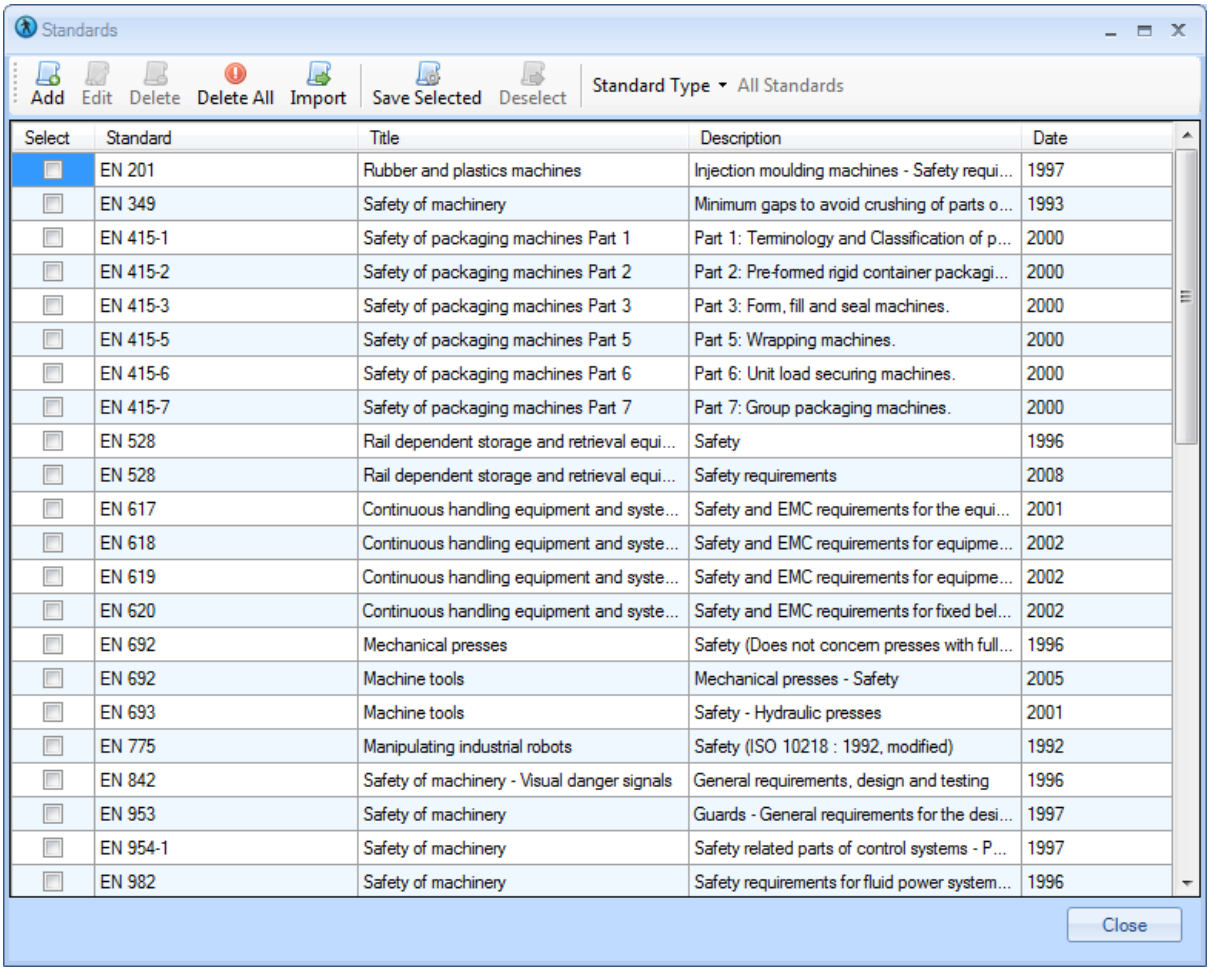
The Main Assessment Pool screen, allows you to add new risk assessments to the Main Pool as well as edit and delete them in the same way as the Risk Assessment Pool screen. The [Full Text] button on this screen will reload the grid view to display the full text of the Hazard Description. After clicking [Full Text] the button will change to [Show Short Text], clicking this will revert the display to show one row per assessment.

You'll notice on the Main Assessment Pool that there is a [Save] button. You can edit the Hazard Description or Control Measures descriptions in the text boxes at the top of the screen and press [Save] to save the changes.

The software gives the option to have separate assessment pools if required. These give the ability to separate types of assessment in an organised way. E.g. A pool of mechanical assessments and a separate pool of electrical assessments. The [Default Pool] button will revert the software to the default pool. Once a separate pool have been opened using the [Open Pool] button, it will stay in use until another pool or default pool are selected.

# Standards

On the questions screen you'll see the [Standards] button. Clicking this will display the list of standards held within the software. Due to copyright we can only display the title and description of the standard. The standards list is also accessible from the Project Functions menu. Accessing the standards through the menu does not allow linking the standards to questions but is used for editing the standards list only.




| Select | Standard | Title | Description | Date |
|---|---|---|---|---|
| ☐ | EN 201 | Rubber and plastics machines | Injection moulding machines - Safety requi... | 1997 |
| ☐ | EN 349 | Safety of machinery | Minimum gaps to avoid crushing of parts o... | 1993 |
| ☐ | EN 415-1 | Safety of packaging machines Part 1 | Part 1: Terminology and Classification of p... | 2000 |
| ☐ | EN 415-2 | Safety of packaging machines Part 2 | Part 2: Pre-formed rigid container packagi... | 2000 |
| ☐ | EN 415-3 | Safety of packaging machines Part 3 | Part 3: Form, fill and seal machines. | 2000 |
| ☐ | EN 415-5 | Safety of packaging machines Part 5 | Part 5: Wrapping machines. | 2000 |
| ☐ | EN 415-6 | Safety of packaging machines Part 6 | Part 6: Unit load securing machines. | 2000 |
| ☐ | EN 415-7 | Safety of packaging machines Part 7 | Part 7: Group packaging machines. | 2000 |
| ☐ | EN 528 | Rail dependent storage and retrieval equi... | Safety | 1996 |
| ☐ | EN 528 | Rail dependent storage and retrieval equi... | Safety requirements | 2008 |
| ☐ | EN 617 | Continuous handling equipment and syste... | Safety and EMC requirements for the equi... | 2001 |
| ☐ | EN 618 | Continuous handling equipment and syste... | Safety and EMC requirements for equipme... | 2002 |
| ☐ | EN 619 | Continuous handling equipment and syste... | Safety and EMC requirements for equipme... | 2002 |
| ☐ | EN 620 | Continuous handling equipment and syste... | Safety and EMC requirements for fixed bel... | 2002 |
| ☐ | EN 692 | Mechanical presses | Safety (Does not concern presses with full... | 1996 |
| ☐ | EN 692 | Machine tools | Mechanical presses - Safety | 2005 |
| ☐ | EN 693 | Machine tools | Safety - Hydraulic presses | 2001 |
| ☐ | EN 775 | Manipulating industrial robots | Safety (ISO 10218 : 1992, modified) | 1992 |
| ☐ | EN 842 | Safety of machinery - Visual danger signals | General requirements, design and testing | 1996 |
| ☐ | EN 953 | Safety of machinery | Guards - General requirements for the desi... | 1997 |
| ☐ | EN 954-1 | Safety of machinery | Safety related parts of control systems - P... | 1997 |
| ☐ | EN 982 | Safety of machinery | Safety requirements for fluid power system... | 1996 |

You can link a standard to a question my simply clicking the tick box in the Select column and then clicking [Save Selected].

You can edit a standard by double clicking the standard in the grid view or by selecting it and clicking the [Edit] button.

To delete a standard, select it from the grid view and click [Delete]. You will be prompted before the deletion is made.

The import function will import a list of standards held in a Microsoft Excel file. The Excel file must be of the correct format for the import to work.

The Excel Workbook sheet must be names 'Sheet1'

Column 1: Prefix

Column 2: Standard Number

Column 3: Part Number

Column 4: Standard title

Column 5: Standard Description

Column 6: Standard type – A, B or C

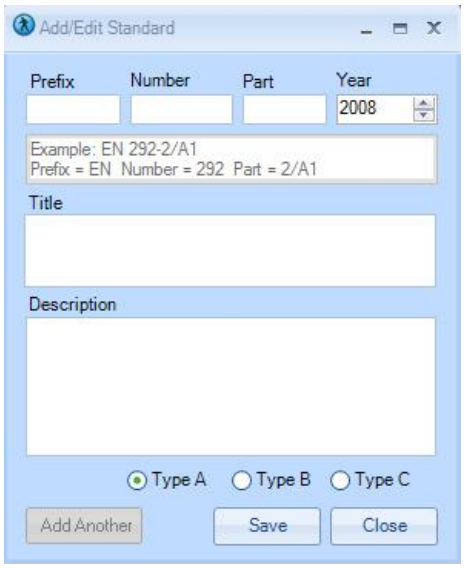
After clicking the [Import] button, the Import Standards screen is displayed. Click [Browse] and locate the Excel file to import. Once select click the [Import] button to start the import process. You will be prompted when the import is complete.

The import feature is intelligent, meaning that it compares your current list with the excel file it's importing. It will update any changes in text and add any new standards it finds in the excel file. It will not import standards that may cause duplication.

The [Standard Type] drop down box allows you to select the type of standards displayed in the grid view, either All, A only, B only or C only.

## Adding a New Standard

To add a new standard click the [Add] button. A new screen is displayed with text boxes to be completed.

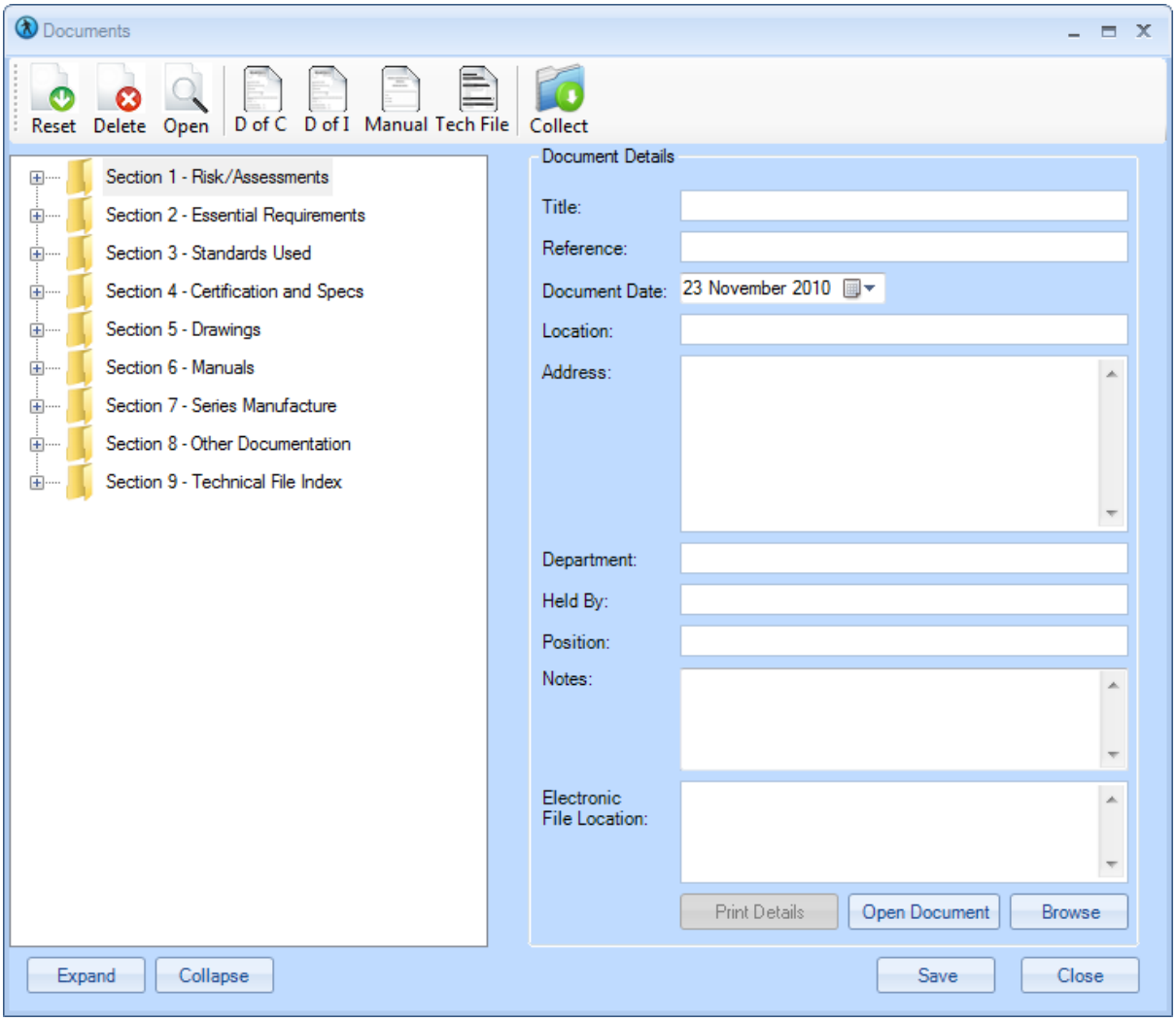



After entering the details click [Save]. If you are entering more then one standard, click [Add Another]. This will clear the text boxes for input of the next standard.

# Machine Documents

The software allows details of documents relating to the machinery to be stored in the Machine Documents section. Documents may include manuals, drawings etc. The actual documents are not stored in the software but are simply linked or recorded. The PUWER and CE projects have different section titles for the documents.

From the Machine Documents menu select [Machine Documents]. The following screen will display a number of sections and sub sections with a tree view.




To add a new document to the documents list, select a subsection from the tree view and enter the document details in the text boxes. If you wish to link to an electronic file held on your IT system, click the [Browse] button and locate the file. Once the details are complete click [Save].

Any linked documents can be viewed by clicking the [Open Document] button. It must be noted that software capable of opening the linked file must be installed on your PC. If an Autocad drawing is linked then, you must have Autocad installed or a software package able to view an Autocad drawing. This obviously goes for any file format linked in to the software.

The details can be printed using the [Print Details] button, to open a print preview of the report.

The [Expand] and [Collapse] buttons are used to expand and collapse the tree view sections.

[Reset] will clear the text boxes of any data displayed.

[Delete] will delete the currently selected document. This will not delete any actual documents linked to the details.

[Open] will attempt to open the linked document.

[D of C] – Declaration of Conformity, clicking this button will display the Declaration of Conformity screen.

[D of I] - Declaration of Incorporation, clicking this button will display the Declaration of Incorporation screen.

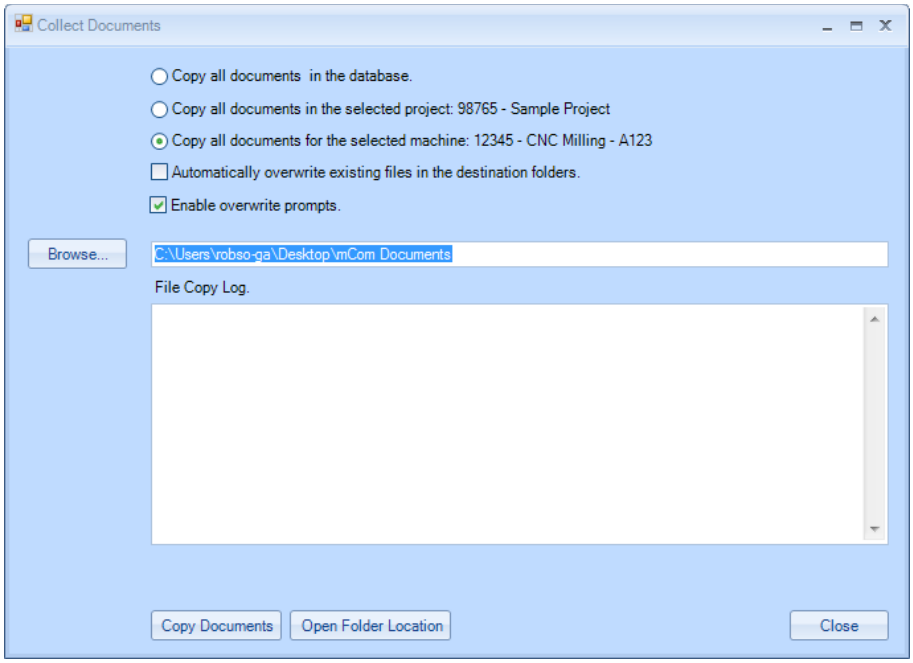
[Manual] – Clicking the manual button will prompt you to save the manual template on your system. The template outlines the sections required for the machinery manual.

[Tech File] – Clicking [Tech File] will prompt you to save the tech file template on your system. The template outlines the sections required within the Technical Construction File.

The options above are only available when carrying out a CE Marking project and not displayed in PUWER or any other project type.

## Collect Documents

The [Collect] option is used to copy all of your linked documents to a single location, selected by the user. The documents will be copied in to their relevant folders to replicate the folder structure in the software.


Collect Documents
Copy all documents in the database.
Copy all documents in the selected project: 98765 - Sample Project
Copy all documents for the selected machine: 12345 - CNC Milling - A123
Automatically overwrite existing files in the destination folders.
Enable overwrite prompts.
Browse...
C:\Users\robso-ga\Desktop\mCom Documents
File Copy Log.
Copy Documents
Open Folder Location
Close

Firstly select what documents you want to copy, either all the documents linked in the database. All the documents for all the machines in the selected project or all the documents for the selected machine.

If you have copied documents previously but need to copy them again, as some may have been edited, you will be prompted to confirm the overwrite of each file. If you are confident that all destination files should be overwritten then you can select the automatic overwrite option.

If you untick [Enable Overwrite Prompts] and do not have automatic overwrite selected, the copy process will only succeed in copying new files.

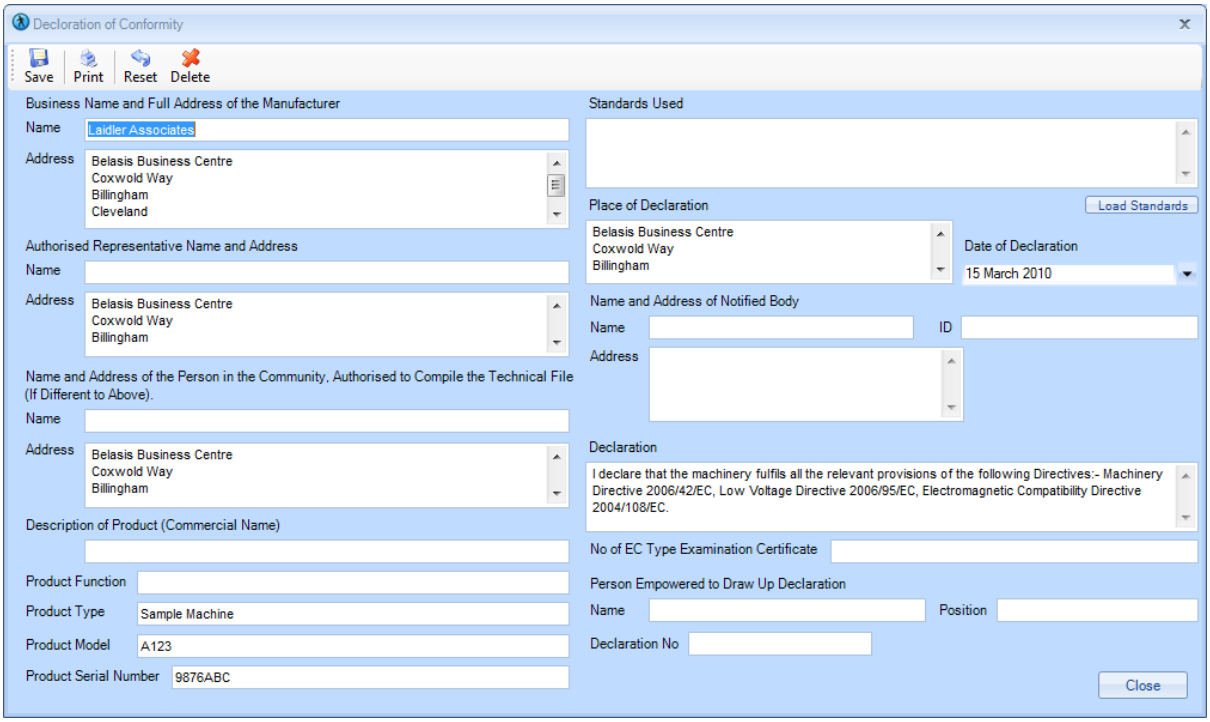
Select the destination folder to copy the documents to using the browse button. Once you selections are complete click the [Copy Documents] button to begin the copy process. The log window will display the progress of the copy process and report any errors encountered.

Once complete the destination folder will be displayed in an explorer window. This window can also be accessed with the [Open Folder Location] button.

Folders are automatically generated and split the documents in to Projects, Machines and then in to folders replicating the folder list in the software. Note that the folders are not word for word the same as the folders in the software, this is to reduce the path length of the folders so as not to exceed the limit.

# Declaration of Conformity

The Declaration of Conformity can be found on the machine documents screen. After clicking the [D of C] button, the Declaration of Conformity screen is displayed.




The software will populate any fields with data input in to the project at other stages. This may not necessarily be correct but can be changed and saved as required. You can only store one Declaration of Conformity per machine.

The function buttons on this screen work as you would expect:

[Save] will save the data input. You must save the DoC before printing.

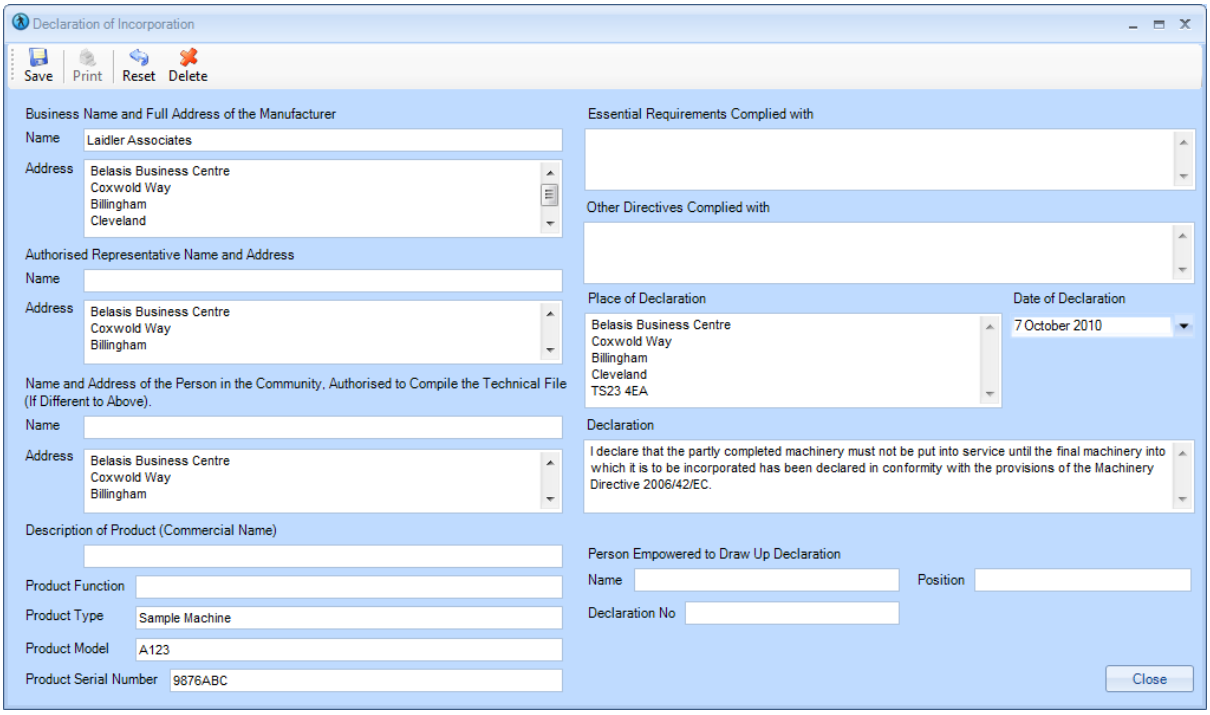
[Print] will print the Declaration of Conformity certificate.

[Reset] will clear all text boxes on the screen.

[Delete] will delete any stored data and clear the text boxes.

# Declaration of Incorporation

The Declaration of Incorporation can be found on the machine documents screen. After clicking the [D of I] button, the Declaration of Incorporation screen is displayed.




The software will populate any fields with data input in to the project at other stages. This may not necessarily be correct but can be changed and saved as required. You can only store one Declaration of Incorporation per machine.

The function buttons on this screen work as you would expect:

[Save] will save the data input. The DoI must be saved before printing.

[Print] will print the Declaration of Incorporation certificate.

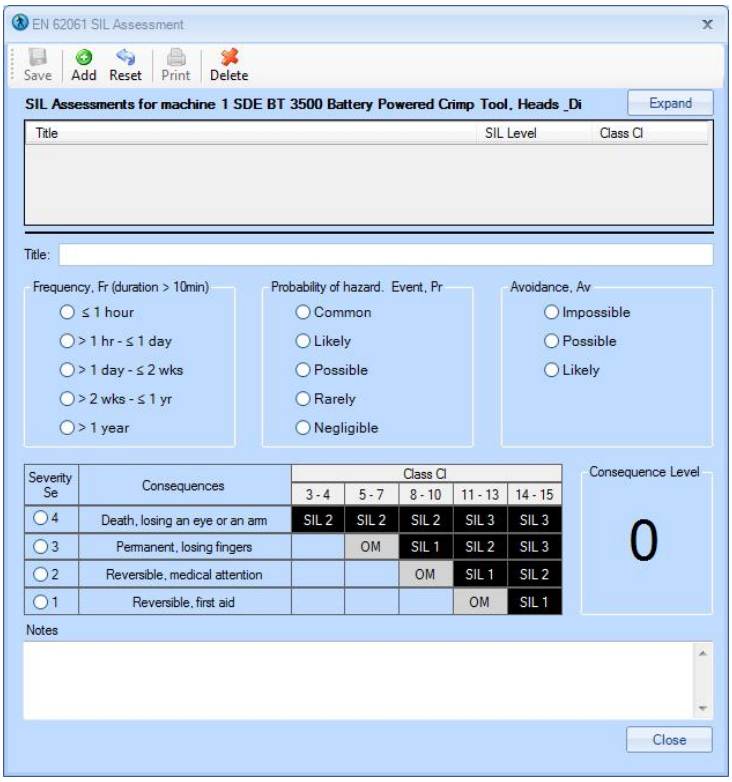
[Reset] will clear all text boxes on the screen.

[Delete] will delete any stored data and clear the text boxes.

# Control Integrity

## EN 62061 Assessment

From the Control Integrity menu select [EN 62061 Assessment]. The EN 62061 assessment screen will be displayed.




This screen is designed to record the outcome of your EN 62061 assessment. Start by inputting the assessment title. An assessment must have a title to allow a save. Using the radio buttons make your selection to complete the assessment. Add any notes required and once complete click the [Save] button.

Click [Add] to add another assessment. This will clear the form of any data currently displayed.

[Reset] will clear all selections and notes on the form.

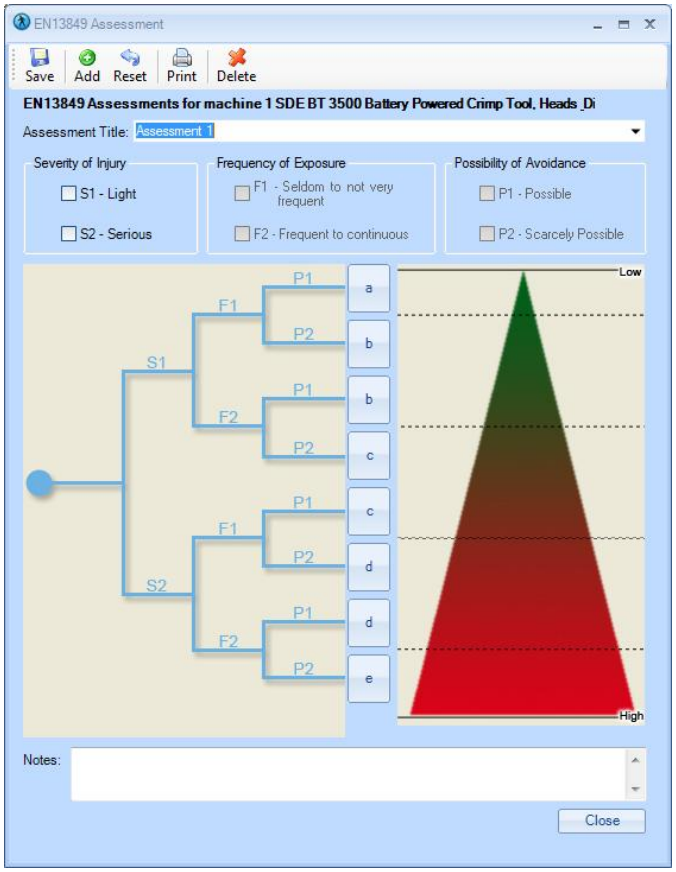
[Print] Will print the assessment report.

[Delete] will delete the currently displayed assessment.

Once you have saved an assessment and on returning to the EN 62061 screen you will see previous assessments listed in the grid view. Simply click the assessment to view the details. If changes are made to the assessment, [Save] must be clicked to store these changes.

## EN 13849 Assessment

From the Control Integrity menu, select [EN 13849 Assessment]. The EN 13849 assessment screen will be displayed.




This screen is designed to record the outcome of your EN 13849 assessment. The first time the screen is displayed on a machine the Assessment Title will default to 'Assessment 1', this can be changed as required. An assessment must have a title to allow a save. Using the radio buttons make your selection to complete the assessment. Alternatively clicking on any of the buttons labelled 'a' though to 'e' will set the radio buttons for the selected level. Add any notes required and once complete click the [Save] button.

Click [Add] to add another assessment. This will clear the form of any data currently displayed.

[Reset] will clear all selections and notes on the form.

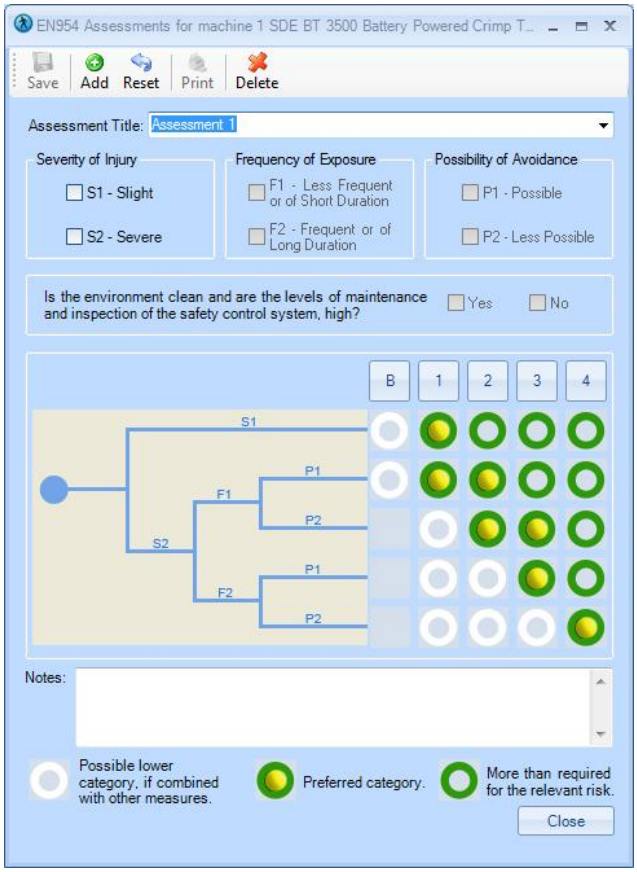
[Print] will print the assessment report.

[Delete] will delete the currently displayed assessment.

Once you have saved an assessment and on returning to the EN 13849 screen you can select previous assessments listed in the drop down combo box 'Assessment Title'. Simply click the assessment to view the details. If changes are made to the assessment, [Save] must be clicked to store these changes.

## EN 954 Assessment

From the Control Integrity menu, select [EN 954 Assessment]. The EN 954 assessment screen will be displayed.




This screen is designed to record the outcome of your EN 954 assessment. The first time the screen is displayed on a machine the Assessment Title will default to 'Assessment 1', this can be changed as required. An assessment must have a title to allow a save. Using the radio buttons make your selection to complete the assessment. Alternatively clicking on any of the yellow buttons to select the category will set the radio buttons for the selected level. Add any notes required and once complete click the [Save] button.

Click [Add] to add another assessment. This will clear the form of any data currently displayed.

[Reset] will clear all selections and notes on the form.

[Print] will print the assessment report.

[Delete] will delete the currently displayed assessment.

Once you have saved an assessment and on returning to the EN 954 screen you can select previous assessments listed in the drop down combo box 'Assessment Title'. Simply click the assessment to view the details. If changes are made to the assessment, [Save] must be clicked to store these changes.

## PRINCIPLES FOR THE DESIGN AND SELECTION OF SAFETY CONTROL SYSTEMS

When selecting or designing a new safety control system or appraising an existing system the following procedure will assist in determining the level of safety control system integrity required.

This method can be found in Euro Norm standard EN 954-1 Safety of Machinery fail-safe Control Circuitry.

Again the starting point is identifying the hazard, then the following is considered and when used in conjunction with the chart given (See Extraction from the software on the next page) the level of safety control system integrity can be determined: -

### Severity of Injury

S1 = Slight (Reversible)

S2 = Severe (Non Reversible)

Take account of the worst case injury. If this is no more than a slight cut or bruise, then select S1. If consequences are more severe, up to and including death, then select S2.

### Frequency of Exposure

F1 = Seldom or of short duration

F2 = Frequent to Continuous

Select F2 if a person is exposed to the hazard frequently. It is considered relevant whether it is the same person or a different person. Select F1 if access is only required from time to time and the exposure time is short.

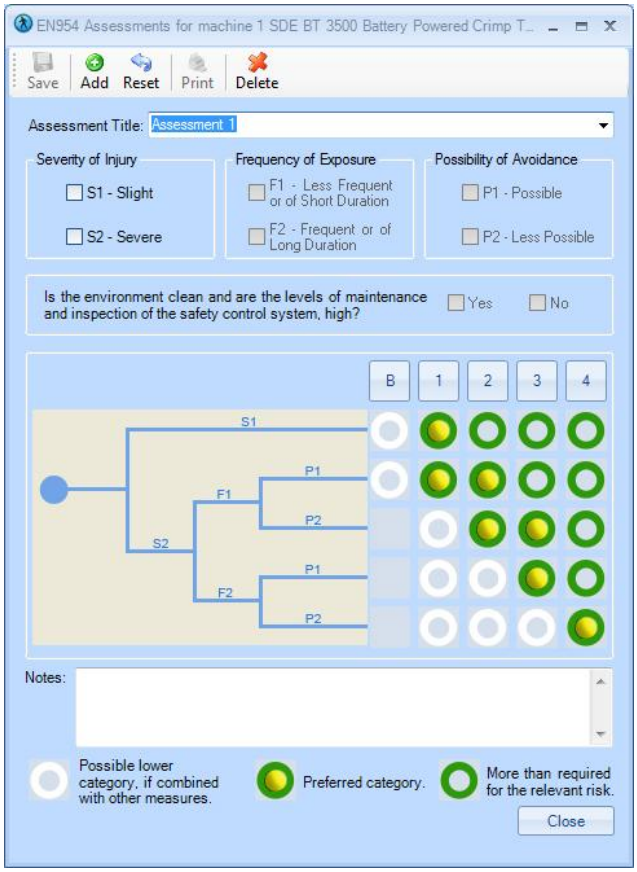
### Possibility of Avoidance

P1 = Possible under specific conditions

P2 = Less Possible

This is generally related to the speed at which the hazard arises, proximity to the hazard point, level of training and expertise of operators. If, in your opinion, the operator could recognise the hazard and avoid injury, select P1. Otherwise select P2.

Using the chart in the following extract from the software and dependent on the answers to the above questions we are lead down a path that leads to one of five categories: B, 1, 2, 3 or 4.

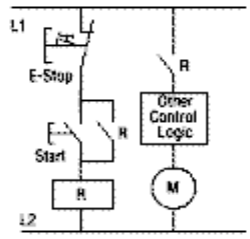
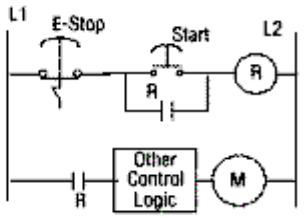
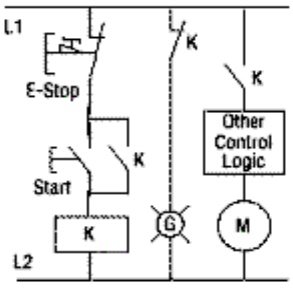
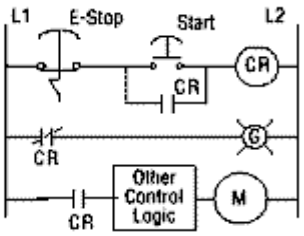
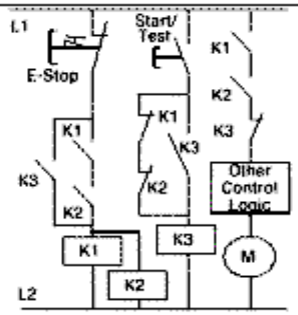
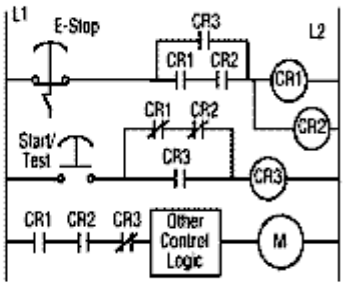
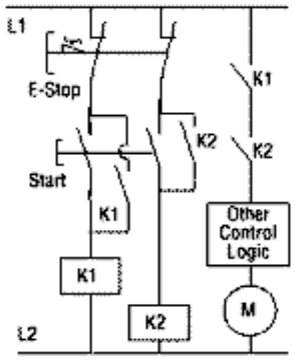
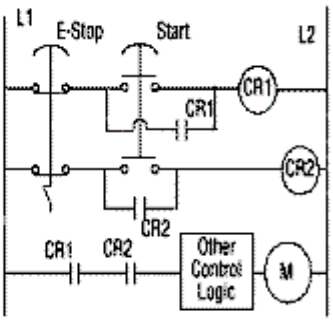
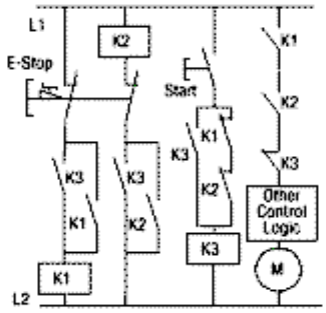
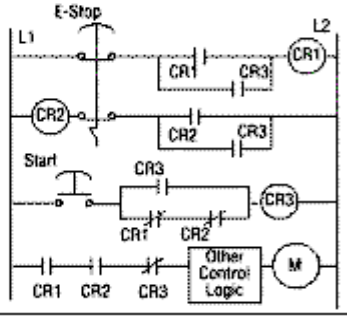



The following tables (Table 1: Guide to EN 954-1 category requirements and table 2: Guide to EN 954-1 category factors affecting performance) gives guidance on the selection of categories for safety related parts of control systems from EN 954-1. Given in table 3 (*sample circuit diagrams*) are simplified example of a circuit diagram for each of the categories specified by EN 954-1.

## Table 1: Guide to EN 954-1 category requirements

| Category | Basic Requirements | What is achieved | |
|---|---|---|---|
| | | At least | At most |
| **B** | Components able to withstand expected influences. | Reliability for normal operation. | Reliability for normal operation. |
| **1** | *Requirements of cat. B together with:* Use of well-tried (e.g., tested or provable) components and safety principles. | Enhanced reliability of the safety function from that of a "normal' device or system. | Elimination of fault possibility's (i.e., **high level of safety performance.** |
| **2** | *Requirements of cat. B and the use of well-tried safety principles with:* A safety function check at machine start-up and periodically if required. | Machine can only start when system is safe | Machine can only start-up when system is safe and faults will be detected by a frequent check (i.e., **high level of safety performance.** |
| **3** | *Requirements of cat. B and th of well-tried safety principles together with:* A single fault will not cause a loss of safety function. | • Detection of some single, *safety-critical* faults at the next demand on the safety function.<br>• Safety-critical faults can accumulate between demands on the safety function.<br>• Non-detected, non-safety critical faults can accumulate and cause loss of safety function. | Detection of ALL single faults (safety-critical and non-safety critical) as they occur (i.e., **high level of safety performance** when it is not feasible to expect multiple independent faults to accumulate within the checking period). |
| **4** | *Requirements of cat. B and th of well-tried safety principles together with:* Assimilation of faults will not cause a loss of safety function. (the number of faults in accumulation to be considered normally two but may be mor depending on the application circumstances) | • Detection of single faults to prevent the loss of safety function.<br>• Foreseeable combinations of faults will not cause loss of safety functions. | • Detection of single faults immediately.<br>• No combination of faults will cause loss of safety functions (this is the ideal but rarely achieved in practice).<br>**High level of safety performance.** |

## Table 2: Sample Circuit Diagrams

| Category | Circuit examples (not contractual) IEC symbols | Circuit Examples (not contractual) NEMA symbols. |
|---|---|---|
| B |  |  |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |

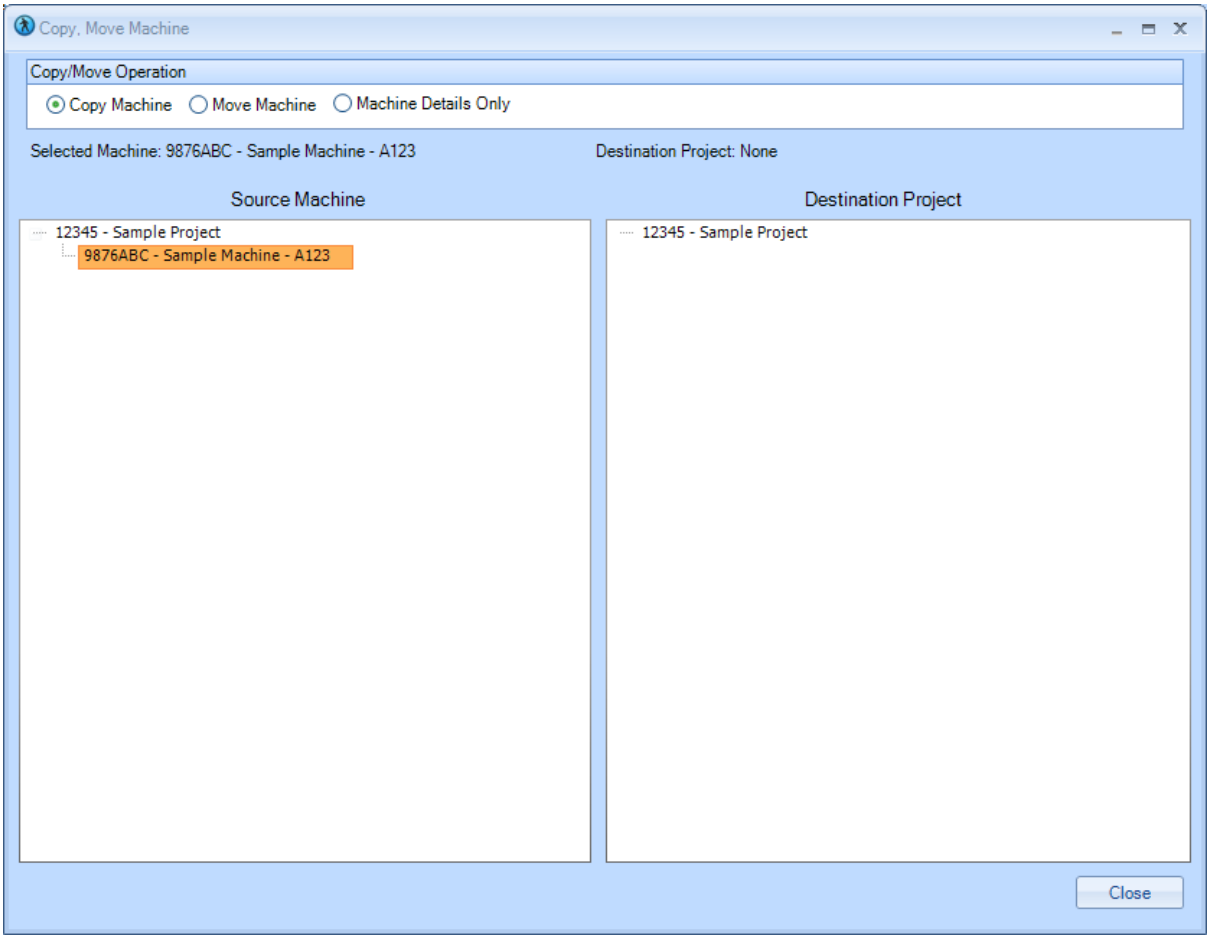
L1= L (+) L2 = N (-) Except Category 4,L1 = 48v Max

This assessment is an extract from EN 954 part 1 and can be used to categorise your safety related control systems. Multiple assessments can be performed using this package by addressing each control system in turn. The available options allow the manipulation of the information supplied (See the following example from the software).

**Note: You must reference the complete EN 954 part 1 standard in order to fully comply.**

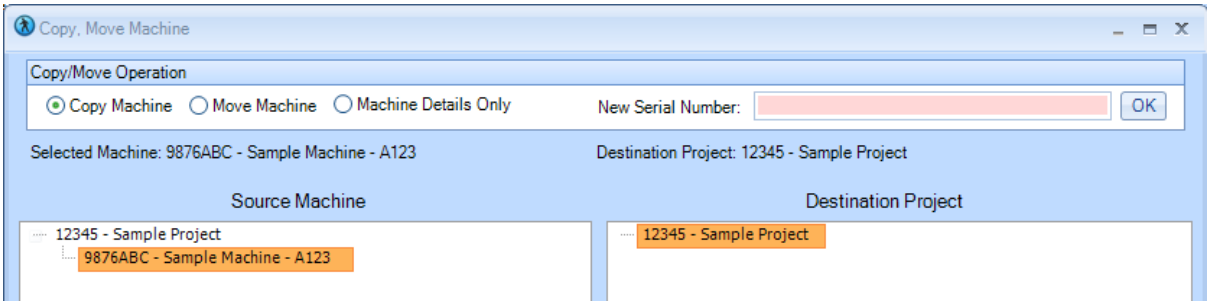
# Copy / Move Machine

The copy / move machine function is found in the Project Functions menu.  Selecting this option will display the Copy / Move Machine form.




The left side of the form shows all the projects and all the machines within each project.  This is the source tree view.  The right side of the screen shows only the projects within the database, this is the destination tree view.

To copy or move a machine simply select the machine from the source tree view.  Select the project to copy/move it to in the destination tree view. After selecting the destination project you are prompted to enter a new serial number for the copied machine.

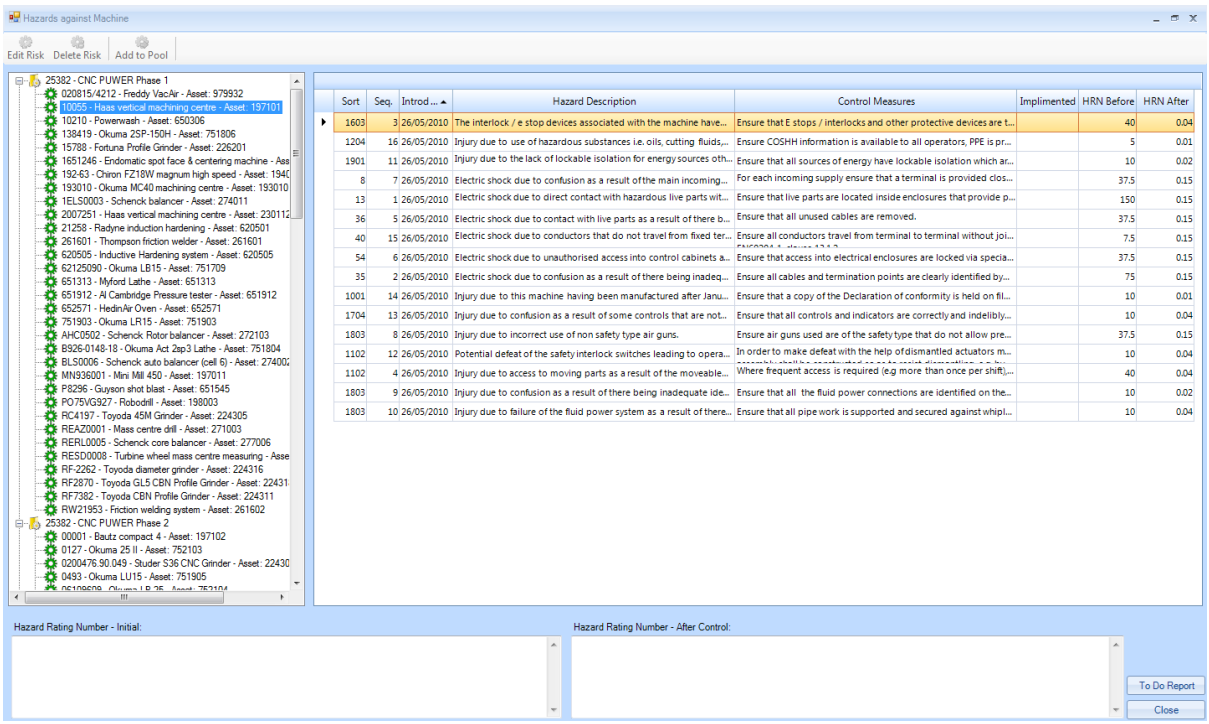


After entering the new serial number, click [OK] to start the copy process. The copy process may take some time to complete depending on the amount of information held against the source machine.

To move a machine the process is the same, but you will not be required to enter a new serial number. Ensure you have selected the [Move Machine] radio button.

## Machine Hazards Screen

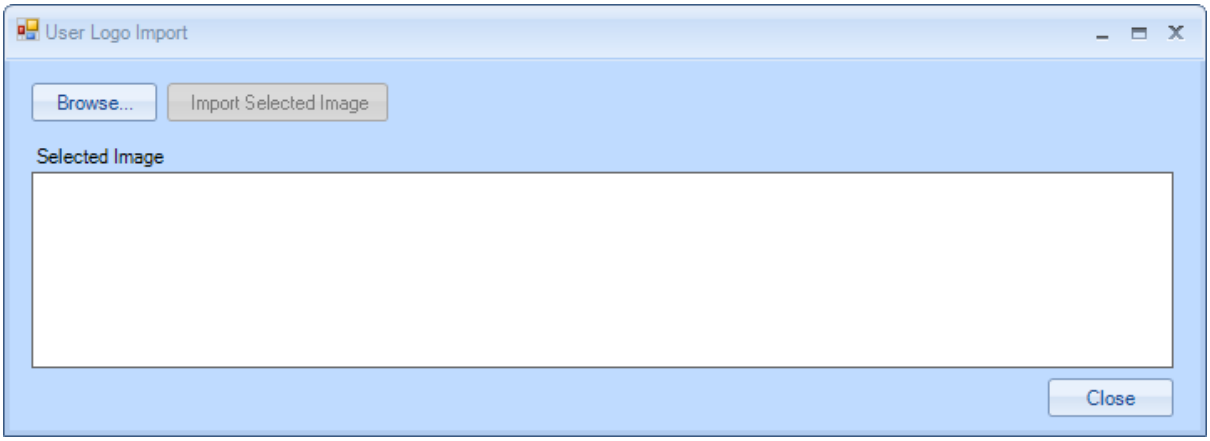
The Machine Hazards screen is intended to give the user a quick method to view risk assessments linked to machines.


Hazards against Machine
Edit Risk
Delete Risk
Add to Pool
25382 - CNC PUWER Phase 1
020815/4212 - Freddy VacAir - Asset: 979932
10055 - Haas vertical machining centre - Asset: 197101
10210 - Powerwash - Asset: 650306
138419 - Okuma 2SP-150H - Asset: 751806
15788 - Fortuna Profile Grinder - Asset: 226201
1651246 - Endomatic spot face & centering machine - Ass
192-63 - Chiron FZ18W magnum high speed - Asset: 1940
193010 - Okuma MC40 machining centre - Asset: 193010
1ELS0003 - Schenck balancer - Asset: 274011
2007251 - Haas vertical machining centre - Asset: 230112
21258 - Radyne induction hardening - Asset: 620501
261601 - Thompson friction welder - Asset: 261601
620505 - Inductive Hardening system - Asset: 620505
6212S090 - Okuma LB15 - Asset: 751709
651313 - Myford Lathe - Asset: 651313
651912 - Al Cambridge Pressure tester - Asset: 651912
652571 - HedinAir Oven - Asset: 652571
751903 - Okuma LR15 - Asset: 751903
AHC0502 - Schenck Rotor balancer - Asset: 272103
B926-0148-18 - Okuma Act 2sp3 Lathe - Asset: 751804
BLS0006 - Schenck auto balancer (cell 6) - Asset: 274002
MN936001 - Mini Mill 450 - Asset: 197011
P8296 - Guyson shot blast - Asset: 651545
PO75VG927 - Robodrill - Asset: 198003
RC4197 - Toyoda 45M Grinder - Asset: 224305
REAZ0001 - Mass centre drill - Asset: 271003
RERL0005 - Schenck core balancer - Asset: 277006
RESD0008 - Turbine wheel mass centre measuring - Asse
RF-2262 - Toyoda diameter grinder - Asset: 224316
RF2870 - Toyoda GL5 CBN Profile Grinder - Asset: 22431
RF7382 - Toyoda CBN Profile Grinder - Asset: 224311
RW21953 - Friction welding system - Asset: 261602
25382 - CNC PUWER Phase 2
00001 - Bautz compact 4 - Asset: 197102
0127 - Okuma 25 II - Asset: 752103
0200476.90.049 - Studer S36 CNC Grinder - Asset: 22430
0493 - Okuma LU15 - Asset: 751905
Sort
Seq.
Introd ...
Hazard Description
Control Measures
Implimented
HRN Before
HRN After
1603 3 26/05/2010 The interlock / e stop devices associated with the machine have... Ensure that E stops / interlocks and other protective devices are t... 40 0.04
1204 16 26/05/2010 Injury due to use of hazardous substances i.e. oils, cutting fluids,... Ensure COSHH information is available to all operators, PPE is pr... 5 0.01
1901 11 26/05/2010 Injury due to the lack of lockable isolation for energy sources oth... Ensure that all sources of energy have lockable isolation which ar... 10 0.02
8 7 26/05/2010 Electric shock due to confusion as a result of the main incoming... For each incoming supply ensure that a terminal is provided clos... 37.5 0.15
13 1 26/05/2010 Electric shock due to direct contact with hazardous live parts wit... Ensure that live parts are located inside enclosures that provide p... 150 0.15
36 5 26/05/2010 Electric shock due to contact with live parts as a result of there b... Ensure that all unused cables are removed. 37.5 0.15
40 15 26/05/2010 Electric shock due to conductors that do not travel from fixed ter... Ensure all conductors travel from terminal to terminal without joi... 7.5 0.15
54 6 26/05/2010 Electric shock due to unauthorised access into control cabinets a... Ensure that access into electrical enclosures are locked via specia... 37.5 0.15
35 2 26/05/2010 Electric shock due to confusion as a result of there being inadeq... Ensure all cables and termination points are clearly identified by... 75 0.15
1001 14 26/05/2010 Injury due to this machine having been manufactured after Janu... Ensure that a copy of the Declaration of conformity is held on fil... 10 0.01
1704 13 26/05/2010 Injury due to confusion as a result of some controls that are not... Ensure that all controls and indicators are correctly and indelibly... 10 0.04
1803 8 26/05/2010 Injury due to incorrect use of non safety type air guns. Ensure air guns used are of the safety type that do not allow pre... 37.5 0.15
1102 12 26/05/2010 Potential defeat of the safety interlock switches leading to opera... In order to make defeat with the help of dismantled actuators m... 10 0.04
1102 4 26/05/2010 Injury due to access to moving parts as a result of the moveable... Where frequent access is required (e.g more than once per shift)... 40 0.04
1803 9 26/05/2010 Injury due to confusion as a result of there being inadequate ide... Ensure that all the fluid power connections are identified on the... 10 0.02
1803 10 26/05/2010 Injury due to failure of the fluid power system as a result of there... Ensure that all pipe work is supported and secured against whipl... 10 0.04
Hazard Rating Number - Initial:
Hazard Rating Number - After Control:
To Do Report
Close

Using the tree view on the left you are able to select any machine and quickly view the risk assessments associated to that machine. The screen also allows you to edit or delete risks but not to add risks. To add a risk you must go through the answer to question method, allowing the software to link the risk to a question.

## Import Reports Logo

Version 1.0.3.8 now gives the ability to have your own company logo on the reports. In the [Database Functions] menu select [Import Reports Logo].

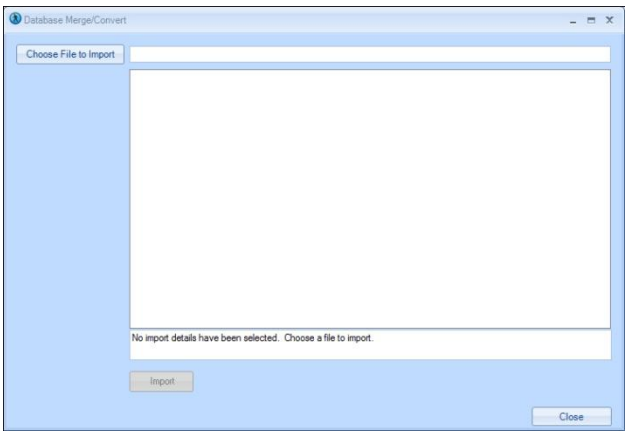



Browse to the location of the image file to import. It must be of file type .jpg. After selecting the file it will be displayed on screen. If you are happy with the image displayed, click [Import Selected Image] to complete the process.

The image size must be 682x117 and 96dpi to display correctly.

## Merge Database

The [Merge Database] function can be found in the Database Functions menu. Currently this feature allows a single machine to be imported from another .VDB3 database. After selecting the Merge Database screen is displayed.




Firstly select the database you wish to copy a machine from by clicking the [Choose File to Import] button]. An open file dialog is displayed. From here locate the file to import and click [Open].

A list of projects and machines will be listed in the tree view. Select the machine you wish to import and click the [Import] button. A prompt will be displayed asking to select a project to copy the

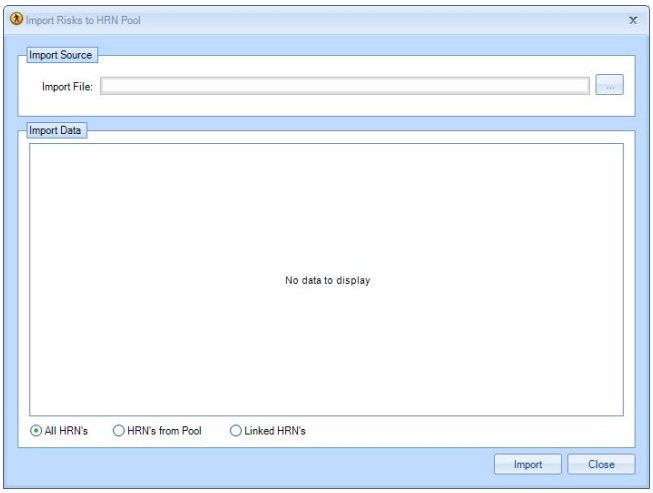
machine to.  Click [OK] on this prompt and you will observe the tree view contents change to the destination databases projects.  Select the project you want to copy the machine in to and once again click [Import].  The import process will now begin.

A prompt will appear when the process is complete.

# Import Risks

This function allows the importing of risk assessments from the other mCom datbases (.vdb3 and .rdb2) as well as from the older RDB database used with the Laidler Associates Risk Management Software System (RMS). The function can be found in the Database Functions menu.

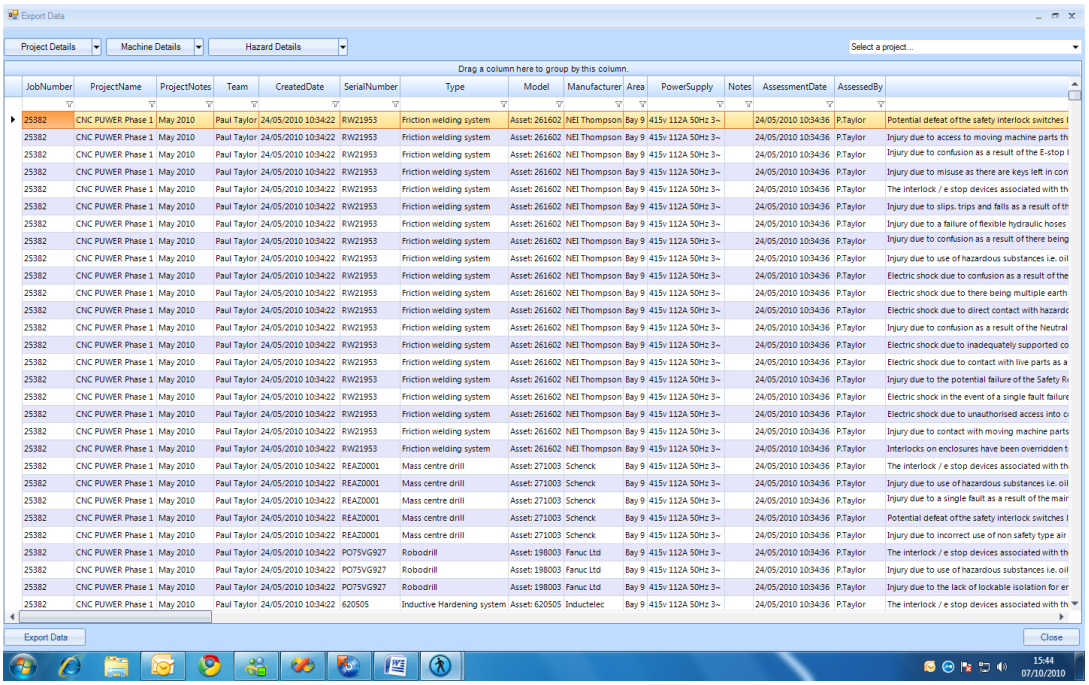
After clicking the function, the Import Risks to HRN Pool screen is displayed.




Browse to the file you wish to import from using the [Browse] button. An open dialog screen will be displayed, locate and open the required file. After opening, the grid view will populate with risks available to import. You can select the specific risks using the radio buttons; All HRN's, HRN's from Pool or Linked HRN's. You can also deselect any risks by unticking the tick box in column one of the grid view.

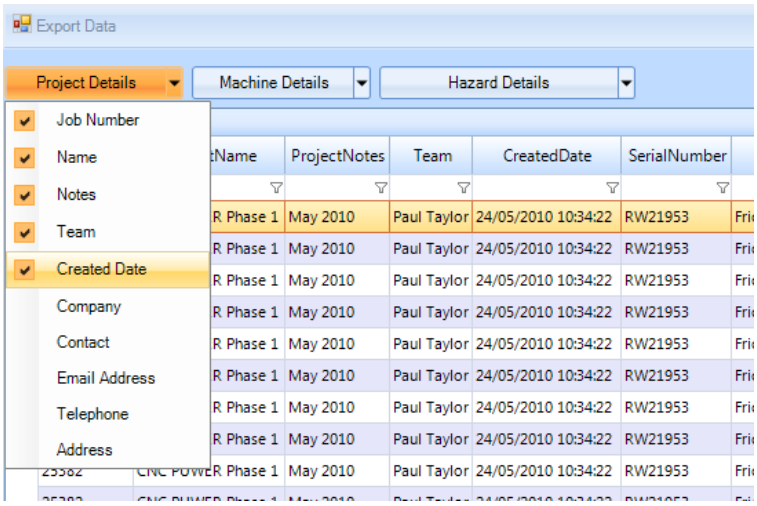
Once your selections have been made, click the [Import] button to begin the import process. All imported risks will be available in the Main Risk Assessment pool.

# Export to Excel

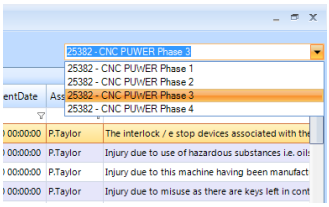



The [Export to Excel] option can be found in the Database functions menu. After clicking the button you are displayed the screen above.

By Default mCom displays all information from Projects, Machines and Hazards. You can select which fields to export by de-selecting the fields from the drop down menus.




You can also filter the export by project, using the [Select from Project] filter.




The data displayed on the screen is the data which will be exported. Click the [Export Data] button to send the data to excel. A save dialog will appear, locate the save location and enter a file name. After clicking save, excel will open displaying the saved file.

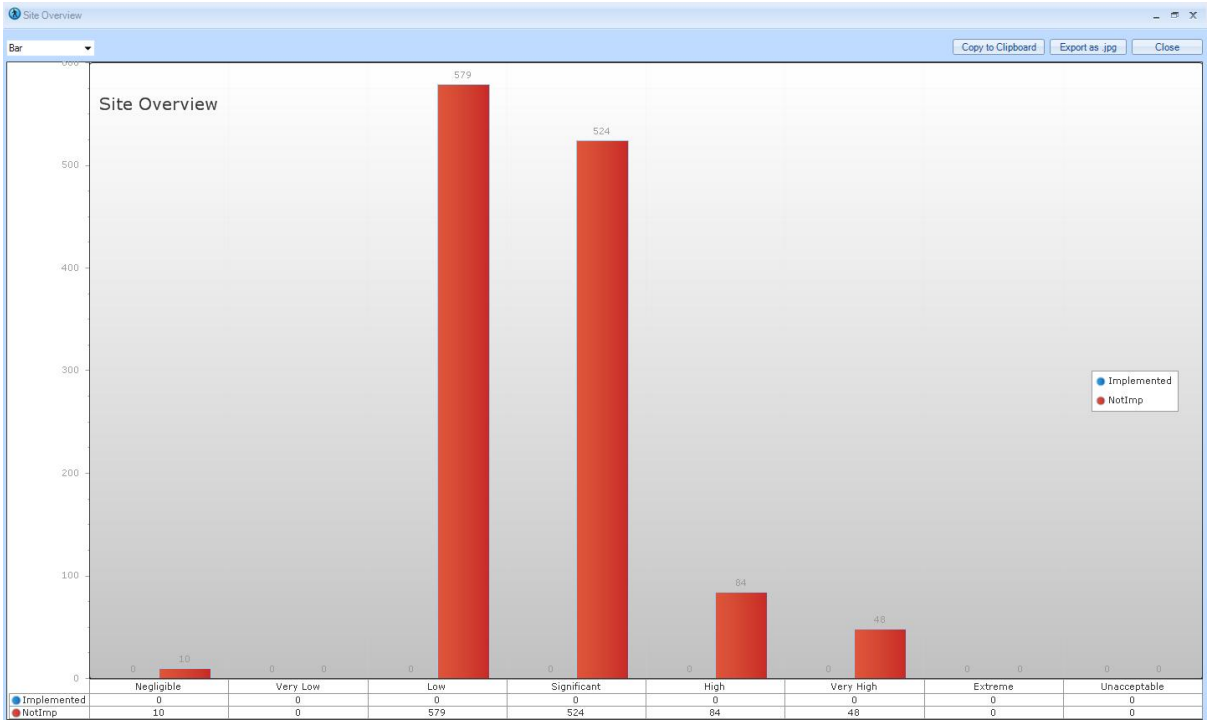
## Spell Check Project

After selecting the project to be spellchecked form the tree view, click the [Spell Check Project] button in the Project functions menu. The spell check screen will be displayed giving options on which part of the project you wish to check. It will default to the whole project.

Once you've made your selection, click [Spellcheck]. When the system will display the text it's checking the text box. When a mistake is found, a red underline denotes the mistake and a correction box is displayed. After making the correction the system will continue to check the rest of the project until it completes all the required fields.

## Site Overview Chart

This option is found in the Project Functions menu. It displays a bar graph showing the number of risk assessments by their level of risk and if they're implemented. The chart can also be displayed as a stacked graph by making the selection from the drop down combo box.




The chart displays all linked risk assessments contained within the database. You can save the chart as a .jpg file or copy it to the clipboard, allowing you to paste it into a Word document for example.

# Photographs

## Adding Project Photographs

This option is found in the Project Functions menu.  After clicking the Project Photographs screen is displayed.  To add photographs in to the database, click the [Add] button. An open dialog is displayed.  Locate and select the photograph you wish to include and click [Open] or double click the image.  You can select more then one photograph by holding [CTRL] and selecting the images or by dragging the selection box across all the required images.

To add a comment to an image, double click the image to display the Image Comments screen. Enter the comment in the text box and click [Close].  You can add comments to further photographs by clicking [Next] or [Previous] to step through all the photographs you've imported.

To delete an imported image, select it from the list view and click [Delete].  This will remove the image from the database not from your system.

To print the photographs, simply click the [Print Preview] button to generate the report.

## Adding Photographs to Risk Assessments

To add photographs to a risk assessment you must first locate and view the risk assessment you wish to add the photographs to.  Once you have the risk assessment screen open click on the Photographs tab.  To add a photograph, click on the [Browse] button to display an open dialog. Locate and select the required image or images using the [CTRL] key to make a multi selection, then click open to copy the image in to the database.

To add a comment to an image, double click the image to display the Image Comments screen. Enter the comment in the text box and click [Close].  You can add comments to further photographs by clicking [Next] or [Previous] to step through all the photographs you've imported.

To delete an imported image, select it from the list view and click [Delete].  This will remove the image from the database not from your system.

The photographs are printed on the To Do report when you select 'Include Photos attached to risks.' In the To Do report options screen.

# Reports

## To Do Report

The To Do Report prints out the selected risk assessments.  From the To Do report options screen you can select to print the standard report, a short report, which has some of the more detailed areas of the risk assessment removed or a To Do report including any attached photographs.

You can also choose to print either, the whole database, whole project or a single machine.  By default, the software selects to print both outstanding and implemented risk assessments.  You can select to print outstanding only or implemented only.

Depending on the amount of machines in a project and number of risk assessments attached the report can take from a few seconds to several minutes to generate as it gathers and formats all the required information.

## Checklist Report

The checklist report shows how the questions were answered, which risk assessment and standards are attached to the question.  By default only the questions that have been answered will be output to the report, but you can choose to print all questions in he options screen.

You can also choose to print either, the whole database the whole project or a single machine.  By default, the software selects to print both outstanding and implemented risk assessments.  You can select to print outstanding only or implemented only.

Depending on the amount of machines in a project and number of risk assessments attached the report can take from a few seconds to several minutes to generate as it gathers and formats all the required information.

## Blank Checklist Report

The blank checklist report  prints all questions in the project.  The report leaves space for answers to be hand written on to the sheet.

To generate a blank checklist you must add a project and machine into the application.  This can simply be a dummy machine if required.

### Standards Report

The standards report prints all standards linked to the machine.

### Machines Report

The machines report will print the details of all the machines in the projects.

## Compact Database

The [Compact Database] option removes empty space from the database file.  Empty space is created when data is deleted and the space isn't reused by the database.  This process will simply reduce the size of you database file.

## History of Risk Assessment within the EEA

### European Economic Area (EEA)

| | |
|---|---|
| The difference between the EU and the EEA is that the EEA is an economic treaty and the EU is more political. Each country doesn't have to be a member of both organisations. | To enable the European Economic Area (not the EU specifically) to trade successfully across boundaries, all industries should have to operate under the same conditions and quality standards. This has required the introduction of legislation across the member states. Although it will mean new or revised industry practices and standards the legislation will have the effect of establishing common minimum requirements across the European Economic Area. |

For this to happen, the European Commission embarked on a policy of harmonisation. Initially the Commission proposed Directives, which would identify a unified approach to the production and trade of products and goods across Europe. However these Directives were proscriptive and it was felt that this was having a detrimental effect on innovation and invention. To counter this, the Commission introduced the New Approach Directives (CE Directives). These Directives are not proscriptive and lay down minimum criteria for compliance. The aim is for the New Approach Directives to be similar in format for ease of reference and use. Perhaps the most significant aspect of the new legislation is the conformity assessment procedure (the means by which the compliance is ensured). The Directives offer a flexible approach.

When a New Approach Directive has been adopted by the Commission it is a legal requirement for each Member State of the European Economic Area to introduce the Directive into its own legislation. These Directives are integrated within the Member States legislation, which necessitate amendments to the existing legislation to enable a co-coordinated approach to be adopted.

#### *Significant Directives*

Machinery Directive 98/37/EC

EMC Directive 89/336/EEC and amendments

Low Voltage Directive 73/23/EEC and amendments

Work Equipment 89/655/EEC (PUWER)

Amended Directive to the Use of Work Equipment Directive (PUWER 98)

#### *The Practical Approach to Machinery Manufactured Outside the EEA*

Machinery manufactured outside of the European Economic Area may be CE marked by the manufacturer but there must be someone within Europe to represent the company. He is termed as The Responsible Person Established In The Community

In case you need further assistance with these issues contact your Regional Director of Safety and Industrial Hygiene.

# PUWER 98 (United Kingdom Legislation)

The **Provision and Use of Work Equipment Regulations** (PUWER) 1992 was spawned from a European Directive about work equipment, the Use of Work Equipment Directive (UWED). Each of the member states was to implement a minimum set of requirements that would govern the provision and use of work equipment. In 1992 the UK version of these requirements took legal standing and was named PUWER 92.

Please check http://europa.eu.int/eur-lex/en/lif/dat/1989/en_389L0655.html for full EU Community legislation in this area.

**This set of regulations applies to all work equipment and anyone owning, in charge of or responsible for (directly or indirectly) should have already ensured compliance with PUWER 92.**

In 1995 the European Commission amended the UWED Directive to create the Amended use of Work Equipment Directive (AUWED) which replaced the UWED Directive. This in turn led to the creation of the PUWER 98 regulations within the UK, which replaces the PUWER 92 regulations entirely.

Due to copyright laws we are unable to include the full set of regulations in this help file. A HSC (Health & Safety Commission) book has been published that not only incorporates the actual regulations but also includes an Approved Code of Practice with guidance notes. It is recommended that in order to comply fully with these regulations a copy of this book be purchased and used in conjunction with this software. The following information has been supplied so that a copy may be bought for around £8.00.

| | |
|---|---|
| Author: | HSC (Health and Safety Commission) |
| Publisher: | HSE Books |
| Title: | Safe use of work equipment |
| Heading: | Provision and Use of Work Equipment Regulations 1998 |
| Sub Heading: | Approved Code of Practice and Guidance |
| ISBN: | 0-7176-1626-6 |
| Contact: | HSE Books, PO Box 1999, Sudbury, Suffolk, CO10 6FS |
| Tel: | 01787 881165 |
| Fax: | 01787 313995 |

The new regulations incorporated the power presses and lifting regulations but also included is an additional section, which forces regular inspections to be completed.

Risk Assessments are a key part to any PUWER assessment and should be cross-referenced with the appropriate section/question at all times. If a problem does occur and you are asked for your reports you will probably be asked primarily for the risk assessments carried out against the equipment in question.

In order to fully comply, Risk Assessments must be carried out and where problems are found they should be reported against a particular section/question.

### *Example Assessment*

(For this example a loose guard exists giving access to moving machinery)

**Section 11:** Access to dangerous parts of machinery

**Question:** Is there any access to dangerous parts of the machinery?

**(Your response to this question may be)**

There is access to dangerous parts of machinery but a risk assessment has been carried out and control measures have been implemented.

**(Or perhaps a response like this)**

There is access to dangerous parts of machinery but a risk assessment has been carried out and control measures have been suggested.

## *Table 1: Guide to EN 954-1 category requirements*

| Category | Basic Requirements | What is achieved | |
|---|---|---|---|
| | | At least | At most |
| **B** | Components able to withstand expected influences. | Reliability for normal operation. | Reliability for normal operation. |
| **1** | *Requirements of cat. B together with:* Use of well-tried (e.g., tested or provable) components and safety principles. | Enhanced reliability of the safety function from that of a "normal' device or system. | Elimination of fault possibility's (i.e., **high level of safety performance.** |
| **2** | *Requirements of cat. B and the use of well-tried safety principles with:* A safety function check at machine start-up and periodically if required. | Machine can only start when system is safe | Machine can only start-up when system is safe and faults will be detected by a frequent check (i.e., **high level of safety performance.** |
| **3** | *Requirements of cat. B and th of well-tried safety principles together with:* A single fault will not cause a loss of safety function. | • Detection of some single, *safety-critical* faults at the next demand on the safety function.<br>• Safety-critical faults can accumulate between demands on the safety function.<br>• Non-detected, non-safety critical faults can accumulate and cause loss of safety function. | Detection of ALL single faults (safety-critical and non-safety critical) as they occur (i.e**., high level of safety performance** when it is not feasible to expect multiple independent faults to accumulate within the checking period). |
| **4** | *Requirements of cat. B and th of well-tried safety principles together with:* Assimilation of faults will not cause a loss of safety function. (the number of faults in accumulation to be considered normally two but may be mor depending on the application circumstances) | • Detection of single faults to prevent the loss of safety function.<br>• Foreseeable combinations of faults will not cause loss of safety functions. | • Detection of single faults immediately.<br>• No combination of faults will cause loss of safety functions (this is the ideal but rarely achieved in practice). **High level of safety performance.** |

1. If, as a consequence of a fault, further faults occur, all the linked faults shall be considered as a single fault.

2. Common mode faults are regarded as a single fault.

3. The occurrence at the same time of two independent faults is not considered.

## *Table 2: Guide to EN 954-1 category factors affecting performance*

| Category | Factors affecting the degree of performance | Typical techniques | Validation methods |
|---|---|---|---|
| **B** | Availability of standards, test data, etc. | Use of materials and components conforming to recognised standards etc. | Check specifications for conformity and suitability. |
| **1** | The simplicity or complexity of the system and principle (i.e., fewer components means fewer potential modes of failure and more viable validation). | • Positive mode operation, life testing, oriented failure mode (e.g., defined weak-link – relevant to simple (e.g., mechanical) equipment<br>• Validation measure are usually too involved or not possible for more complex (e.g., electronic) equipment | • Fault analysis (e.g., Failure Mode and Effects Analysis or Fault Tree Analysis)<br>• Testing.<br>• Checking of safety margins. |
| **2** | The frequency and nature of the check (i.e., more frequent checks allows less time for faults to remain undetected). | Simulation of device actuation and functional check by machine control system or dedicated monitoring unit with start interlock. | Theoretical analysis and/or testing. |
| **3** | The frequency and nature of the check (i.e., more frequent checks allows less time for faults to accumulate). | • Dual contact (or two separate) devices linked by two circuits to a separate unit which compares operation of each circuit at change of state.<br>• Suitable where some faults cannot be prevented and there is relatively frequent actuation – particularly relevant to electro-mechanical technology. | Theoretical analysis and/or testing. |
| **4** | The simplicity or complexity of the system and principle (i.e.., fewer or simpler components mean fewer fault combination permutations) | Dynamic techniques.<br>Relevant to equipment which must be complex to perform its primary task.<br>Particularly relevant to electronic technology. | Theoretical analysis and/or testing. |

## Definitions

### *Definition of a machine*

An assembly of linked parts or components at least one of which moves, with the appropriate actuator, control and power circuits, etc, joined together for a specific application, in particular for the processing, treatment, moving or packaging of a material. Machinery moved by manual effort is excluded. The term machinery also covers an assembly of machines, which in order to achieve the same end, are controlled so that they function as an integral whole.

The Machinery Directive also addresses the issue of complex machinery and the standards committee 6.2 on the Machinery Directive has assisted in clarifying this issue - complex machinery is

an assembly of two or more machines which can operate independently and there are two scenarios which cover most eventualities.

### Example 1

The contractor uses new machinery to construct an assembly. He may purchase or import machinery that conforms to the Directive and is accompanied by a Declaration of Conformity or a Declaration of Incorporation. The contractor is responsible for CE Marking the whole assembly, providing the Technical File, Declaration of Conformity and affixing the CE Mark in a position representative of the whole assembly.

The contractor must make sure that the Technical Files of the sub assemblies will be made available if required

### Example 2

The contractor is involved several years after the machinery has been put into service e.g. when modernising a series of machines by interlinking them together. The original machines may or may not bear the CE mark (depending on whether or not it predates the CE Mark). The contractor must endeavor to comply with the Directive, wherever possible, in accordance with the state of the art. The contractor must provide the Technical File, affix the CE Mark and draw up a Declaration of Conformity.

### *The Responsible Person*

| | |
|---|---|
| *EHSR = Essential Health & Safety Requirements* | The responsibility for demonstrating that the product satisfies the EHSR rests on the manufacturer or the importer into the EEA (the Responsible Person). The Responsible Person can be a manufacturer outside the EEA but the importer into the EEA will need to ensure that the product or machine or safety component complies. If not, the importer will be responsible for bringing it into conformity. |

## Risk Assessment Process (HRN)

There are many methods of risk assessment.

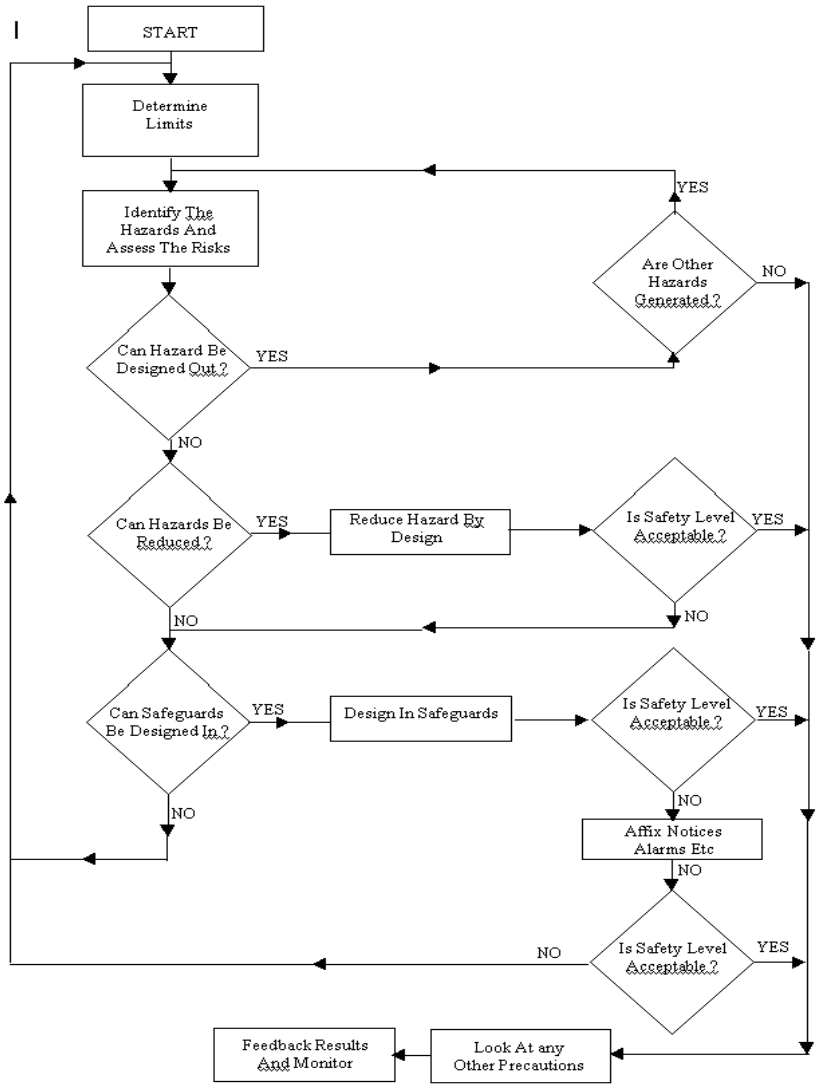
*The Preliminary Hazard Analysis (PHA) is the method we will concentrate on, it is easy to understand, lends itself to machinery and has given good results in the past on a wide range of machinery.*

The method described here is a recognised method and can be referenced in the book "Safety Reliability & Risk Management" (ISBN: 0-7506-4016-2) by Sue Cox & Robin Tait of Loughborough University in the UK.

This method utilises a Hazard Rating Number system (HRN) and allows identification of a number of risk levels in order to prioritise the implementation of the control measures according to the degree of risk.

Like all methods of risk assessment it is subjective and asks you to make judgmental decisions based on your experience, knowledge of the machine and how it operates, and any information you have at hand at the time. This should be supported by your experience and training on risk assessment in particular the method you are employing.

## Risk Assessment Chart.




## Other Common Risk Assessment Methods

There are many methods of risk assessment. Annex B of EN 1050 lists several of the more common methods.

**Preliminary hazard Analysis** (PHA) is an inductive method whose objective is to identify the hazards, hazardous situations and hazardous events that could lead to an accident for all phases of life of a specified system, sub-system or component. It is an inductive method.

**'What-if'** is another inductive method. For simple applications, the machine's design, operation and use are reviewed. 'What-if' questions are formulated at each step and answered to evaluate the effect of failures or errors. In more complex applications, 'What-if' can be applied by using a checklist.

**Failure Mode and Effects Analysis** (FMEA) is an inductive method whose main purpose is to evaluate the consequences and frequency of component failure. If operator error or operating procedures are more significant, other methods are likely to be more suitable.

**Fault Simulation** for Control Systems is an inductive method with test procedures based on two criteria: technology and the complexity of the control system. In general the following are applicable: practical tests on the actual circuit and simulated faults on the component; and a simulation of control behavior either by hardware and/or software methods.

**MOSAR** (Method organised for a Systematic Analysis of Risks) is a complete approach made up of 10 steps. The system to be analysed is looked at as several sub-systems which interact. Hazards, hazardous situations and hazardous events are identified in a table.

**Fault Tree Analysis** (FTA) is a deductive method carried out from an event that is considered to be unwanted. This enables the user to find the whole set of critical paths that leads to the unwanted event. It is specified in IEC 1025 fault Tree Analysis.

**The DELPHI** technique questions a large circle of experts in several steps, where the result of the previous step with additional information is communicated to all participants. It is a forecasting method, often used in idea generation.

**Inductive**

**Deductive**

## Hazard Identification

**A hazard is:-**

Anything that has the potential to do harm, a source of possible injury or damage to health.

**A risk is:-**

The likelihood of someone coming into contact with a hazard and the degree of injury or damage to health that could be caused should contact occur.

**A hazardous situation is: -**

Any situation where a person or persons are exposed to a hazard.

**Examples**

*A moving belt on a conveyor would be a hazard. The risk would be the likelihood of someone coming into contact with an in-running nip or being drawn along the belt by a protrusion and the severity of injury or damage to health that could be caused.*

*An electrical enclosure containing voltages above 50v AC and 60v DC that has uncovered terminations is a hazard even though the enclosure may be kept locked and strict key control enforced. The reason for this is that if an electrician had to carry out diagnostic testing on a live enclosure they could inadvertently touch an adjacent terminal with a tool etc. The risk would be the likelihood of that happening and the severity of injury or damage to health that could be caused.*

## Common Hazard Categories

1. Mechanical hazards.
2. Electrical hazards.
3. Thermal hazards.
4. Hazards generated by noise.
5. Hazards generated by vibration.
6. Hazards generated by radiation.
7. Hazards generated by materials and substances (and their constituent elements) processed or used by the machinery.
8. Hazards generated by neglecting ergonomic principles in machinery design.
9. Combination of above hazards.
10. Unexpected start-up or over-run/over-speed (or any similar malfunction).
11. Impossibility of stopping a machine in the best possible conditions.
12. Variations in the rotational speed of tools.
13. Failure of the power supple.
14. Failure of the control circuits.
15. Errors of fitting.
16. Break-up during operation.
17. Falling of ejected objects of fluids.
18. Loss of stability / overturning of machinery.
19. Slip, trip and fall of person (related to machinery).
20. Additional hazards, hazardous situation and hazardous events due to mobility.
21. Hazards linked to the work position (including driving station) of the machine.
22. Hazards due to the control system.
23. Hazards from handling the machine (lack of stability).
24. Hazards due to the power source and to the transmission of power.
25. Hazards from / to third persons.
26. Hazards. Hazardous situation and hazardous events due to lifting.
27. Hazards, hazardous situations and hazardous events due to the lifting or moving of persons.

## Preliminary Hazard Analysis using Hazard Rating Number System

With this method you are asked to assign numerical values to phrases relating to the:

| | |
|---|---|
| **Likelihood of Occurrence** | **(LO)** |
| **Frequency of Exposure** | **(FE)** |
| **Degree of Possible Harm** | **(DPH)** |
| **Number of People at risk at any one time** | **(NP)** |

**Likelihood of Occurrence**: The chances of a person(s) coming into contact with the hazard or being in a situation that they are exposed to a hazard.

**Frequency of Exposure:** How often are person(s) exposed to a hazard?

**Degree of Possible Harm:** The maximum degree of injury or damage to health that could be caused.

**Number of People at risk at any one time:** The number of people that are exposed to the hazard at any one time.

Firstly, the hazard has to be identified. Using the following table and knowledge of how the machine operates, the likelihood of a person or persons coming into contact with the hazard has to be decided and the relevant numerical value from the chart allocated.

When this decision is made the same thought process is used to determine the frequency of exposure to the hazard, the degree of injury or damage to health that could be caused should the person or persons come into contact with the hazard and how many people are exposed to the hazard at any one time.

The next step is to multiply all the numbers together to give the hazard rating number (HRN). From this and using the table shown on the next page, the degree of risk from negligible to unacceptable can be determined.

When carrying out a risk assessment on machinery that has existing control measures, for example **guards, light curtains, pressure mats, interlocks etc**, these control measures should be disregarded for the purposes of risk assessment only. The reason for this is that after carrying out the initial assessment the existing control measures can be introduced and a re-assessment completed to ascertain whether or not the control measures are adequate and reduce the risk to an acceptable level.

## Hazard Rating Number System Chart

**LO (Likelihood of Occurrence) / FE (Frequency of Exposure) Table**

| LO Likelihood of Occurrence | | | FE Frequency of Exposure | |
|---|---|---|---|---|
| **0** | Impossible | Cannot happen | **0.1** | Infrequently |
| **0.1** | Almost unlikely | Possible in extreme circumstances | **0.2** | Annually |
| **0.5** | Highly unlikely | Conceivable | **1** | Monthly |
| **1** | Unlikely | Could occur | **1.5** | Weekly |
| **2** | Possible | Unusual | **2.5** | Daily |
| **5** | Even Chance | Could happen | **4** | Hourly |
| **8** | Probable | Not surprising | **5** | Constantly |
| **10** | Likely | To be expected | | |
| **15** | Certain | No doubt | | |

**DPH (Degree of Possible Harm) / NP (Number of Persons at risk) Table**

| DPH Degree of Possible Harm | | NP risk | Persons at |
|---|---|---|---|
| **0.1** | Scratch or bruise | **1** | 1-2 persons |
| **0.5** | Laceration of mild ill health effect | **2** | 3-7 persons |
| **1** | Break of a minor bone or minor illness (temporary) | **4** | 8-15 persons |
| **2** | Break of major bone or major illness (permanent) | **8** | 16-50 persons |
| **4** | Loss of limb, eye/serious illness of a temporary nature | **12** | 50+ persons |
| **8** | Loss of limbs, eyes/serious illness of a permanent nature | | |
| **15** | Fatality | | |

**Risk Calculation**

| **Risk** | Negligible | Very low | Low | Significant | High | Very high | Extreme | Unacceptable |
|---|---|---|---|---|---|---|---|---|
| **HRN** | 00-01 | 01-05 | 05-10 | 10-50 | 50-100 | 100-500 | 500-1000 | Above 1000 |

For guidance only the following table (Guidance Timeframes) gives typical suggested time periods in which corrective action(s) for the various degrees of risk should be implemented.

## Guidance Timeframes

| Risk | Negligible | Very low | Low | Significant | High | Very high | Extreme | Unacceptable |
|---|---|---|---|---|---|---|---|---|
| **Time** | Accept risk | < 1 year | < 3 months | < 1 month | < 1 week | < 1 day | Immediate | Stop activity |

# Control Measures

**The Hierarchy of Control Measures**

When the hazard has been identified and the risk assessed, the next activity is to reduce the level of risk to the lowest level that, in the opinion of the assessor(s), is possible. This however, must be done in a structured manner. The recognised hierarchy of control measures is: -

1. Eliminate or reduce the hazard; that is design it out or remove it if reasonably practicable, if not then-
2. Eliminate the need for persons to be exposed; that is remove the need for operator intervention if possible, if not then-
3. Use guards; that are physical or non-physical electronic barriers between persons and the hazard if possible, if not then.
4. Reduce the probability of occurrence by altering the task, the method used or the use of jigs, holders, push sticks etc. If not then-
5. Reduce the degree of harm; that is by reducing the area of the hazard that can do harm or slow down the speed of approach of the hazard or use different components that present a lower degree of harm; the provision of personnel protective clothing, if not then-
6. Warn and inform (only if adequate safety can be achieved by these measures); that is warning notices, training, information for safe use, etc.

# Risk Assessment Example

Risk of Injury due to the present guarding, partially fitted, allowing access to the moving parts.

| **L.O.** | | **F.E.** | | **D.P.H.** | | **N.P.** | | | H.R.N. |
|---|---|---|---|---|---|---|---|---|---|
| 2 | X | 5 | X | 4 | X | 1 | = | | 40 |
| Degree of risk: | | | | | | | = | | **Significant** |

Clearly from this example we can see that the existing guarding, whilst offering a certain amount of protection, is not adequate and the degree of risk can be reduced further by fitting a guard that completely prevents contact with the hazard but does not affect the production.

Control Measure:

Fit a tunnel guard that complies with relevant standards for guarding and safety distances, and prevents all access to the moving parts.

After control measures fitted:

| **L.O.** | | **F.E.** | | **D.P.H.** | | **N.P.** | | | H.R.N. |
|---|---|---|---|---|---|---|---|---|---|
| 0.1 | X | 0.1 | X | 4 | X | 1 | = | | 0.04 |
| Degree of risk: | | | | | | | = | | **Negligible** |

# Glossary of Terms

### European Commission

A representative committee of member state governments who steer the legislation of the European Union.

### European Economic Area

Members of the European Union who want to harmonise their industrial practices to promote cross-border trade.

Countries in the EEA as of August 2001:

| | |
|---|---|
| Austria | Italy |
| Belgium | Liechtenstein |
| Denmark | Luxembourg |
| Finland | Netherlands |
| France | Norway |
| Germany | Portugal |
| Greece | Spain |
| Iceland | Sweden |
| Ireland | United Kingdom |

### PUWER

Provision and Use of Work Equipment Regulations, updated in Britain in 1998. (PUWER 98).